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The Cheap Cottages Exhibition.

IT is to be regretted that those who organised the Cheap CottagesExhibition at Letchworth should have let it be known beforehand, either officially or non-officially, that they were in search of a cottage which could be adequately built for 150*l.* If, instead of that, they had announced that they wished to offer a prize for the most economically built cottage which would be comfortable and weatherproof, and sufficiently large to accommodate a certain number of persons, there would have been more chance of getting a fair statement as to the cost of each. As it is, we find that nearly everything on the ground, of all kinds of different shapes, sizes, and materials, can be built for 150*l.*; or sometimes, with an affectation of greater exactitude, for 149*l.* or 148*l.* 10s., and so on. As to the majority of these statements we fear that we must avow an entire scepticism. Whether any of the cottages, and which, could really be built for the sums stated, it would be impossible to say without a much more detailed examination and computation than was possible on the ground. But we think the number would be very small.

The exhibition may be considered to resolve itself, geographically speaking, into two groups ; the set which are concentrated near the railway station, and a smaller group which are at some distance off across Norton Common. These latter we cannot speak of on the present occasion, as the first-named group were in themselves sufficiently numerous to occupy a long morning in their examination. But there are a good many exhibits still unfinished, and we shall take an opportunity of making another visit, when we can examine the outer group as well as those of the nearer group which are not completed at present. There is also in a temporary building an exhibition of plans, which we will examine on another occasion.

On the left of the entry to the grounds Dando's windmill pump is seen at work raising water from an artesian well, and on the right is a specimen of a bungalow (No. 1), or what they call "a week-end cottage," erected by Messrs. J. Hawkins & Co., of Ashford, which has some good points. This is a wood-framed cottage with a fireproof lining (composed mainly of asbestos) and "Stonwod" floors, which latter are very satisfactory ; we have not come across the material actually laid down in a house before. The mistake of the exterior design is that it wants simplicity, and makes an effort to be picturesque in a rather feeble manner. And we may add that this striving after the artificial picturesque is a weakness which permeates a considerable proportion of the exhibition. That cheap cottages should be picturesque if possible is certainly desirable ; but the picturesque will not always come when called. The old country cottages of England which are picturesque were not built to be so ; they were built merely with the readiest materials and in the most convenient method known to their builders ; when they strike us as picturesque, it is because of age, of the toning and weathering of materials by which they become part of the colour of the landscape, and of a certain association with the past which appeals to the imagination. This quality of the picturesque cannot be consciously produced to order ; the attempt to do it defeats itself, and is apt to turn away the mind of the designer from what in this case is the real object—the production of a soundly-constructed cottage at a cheap rate. We see instances of this in the exhibition ; the introduction of foolish sham timberwork on the face of walls, and the constant employment of very high-pitched roofs, for which there is no necessity, and which are only a concession to the supposed demands of the picturesque. There appears to be only one cottage in the whole number in which the now perfectly easy expedient of a flat roof is taken into account* ; this, which we have only examined from the illustrations attached to the catalogue, is one designed by Mr. Brodie, the City Engineer of Liverpool ; it is in the outlying group which we have not yet inspected. We should certainly have expected that some among the competitors might have remembered that it is possible now to roof a cottage without cutting it up into high-pitched gablets and dormers.

Messrs. Hawkins's bungalow, just

* It is perhaps needless to say that by "a flat roof" we do not mean one literally and geometrically flat.

referred to, though very nice for "a week-end cottage" in summer or autumn, is not however a house to winter in, and hence does not really fall within the scope of the exhibition, which is to provide cheap cottages as permanent houses. We fear that some of those exhibited as such would be found wanting under stress of time and weather. This is an exhibition of thin-walled houses. External walls of more than 9 in. thick are not to be found. Ordinary 9-in. brickwork we have always said is not sufficient for external walls, whether in town or country; but in most of the buildings shown we are not left to this; either the brick walls are covered with some weather-fending material, or the wall is of concrete or other material. There are some walls even thinner than 9 in. which nevertheless we think may prove practically sufficient. An unfinished house by Messrs. Williams & Hodgson (not in the catalogue) seems to promise well in this way; the walls (9 in. thick) are built of a patent perforated brick made by the London & Brighton Brick Co., which appears likely to make a more weather-proof wall than ordinary 9 in. brickwork; the upper part is rough-cast. Mr. John McManus exhibits a very nicely finished cottage (11) with walls of timber and boarding and partly of cement, 6 in. thick; unfortunately it is partly constructed (as described in the catalogue) "with overlays representing open timber work," a mere piece of sham; but it is a pretty cottage externally; of the interior nothing can be said, as it was locked up, as was the case with a few others in the show; a foolish thing to do when the houses are put here to be looked over. Messrs. Green Bros. exhibit a cottage (14), designed by Mr. Houfton, of Chesterfield, which has a great deal to recommend it; the walls are of 9 in. brickwork covered by white cement roughcast, with green-painted woodwork; the interior fittings are simple and solid (the circular window on the staircase ought to be made to open), and the whole in good taste. This is stated to have been built here for 150*l.*; but then comes the note "can be duplicated" (built somewhere else) "for 175*l.* including profit, architects' fees, and men's travelling expenses"; so that this cannot be regarded as a 150*l.* cottage. Next to this is the cottage of which Messrs. Stanley Barrett & Driver are the architects, in somewhat the same style (it would be much better without the foolish sham half-timber work planted on to the gables). The architects contend that "for an ideal labourer's cottage a small parlour is an absolute necessity"; but here we are not seeking for an *ideal* labourer's cottage, but for a *possible* one at 150*l.* We are told this can be duplicated in any district at the same cost "provided the conditions are the same," a wily sentence which may cover a good deal. The walls are of 9 in. brickwork with a coat of cement, and while this is wet, small stones mixed with lime are thrown on; "this makes a 9 in. wall as good as an 18 in. one." Not quite, but it is certainly a different matter from the bare 9 in. wall. The same architects show another in much the same style, but "specially designed as a pleasure cottage," at a cost of 210*l.*, and we are promised that a similar cottage can be erected in any district at the same cost. We doubt it, and we much more than doubt the promise of building Messrs. Picton & Hope's cottage (17: unfinished) for 150*l.*, which is absurd on the face of it; they may by some special arrangement be getting it up here for 150*l.*, but it could not possibly be regarded as a building to be generally carried out at that price.

A remarkable contrast is afforded by the next two exhibits. No. 19 is a picturesque cottage designed by Mr. Lionel F. Crane, a timber-framed building on concrete foundations with overlapping weather-boarding, treated with carbolineum to prevent rotting, and roofed with old local tiles on boarding and battens. It looks very well, as a specimen of the picturesque in cottage-building, but it is far too fanciful and too much cut up in its outline to afford a type for cheap cottages on an estate; it is the kind of thing an owner might build as an ornamental lodge at his park gate. As such it is good, as all the details are quiet and in good taste. Messrs. Heal & Son have filled it with some excellent cottage furniture of a solid type; the furniture of one of the bedrooms indicates that it is proposed to indoctrinate the agricultural labourer and his partner with the hygienic advantages of *lits jumeaux*, a point to which the labourer has probably not arrived even in France, the country of matrimonial refinements. The cottage No. 20, exhibited by the Bournville Estate Trust, is a plain square-lined erection of 9 in. walls of ordinary brickwork, the window frames under segmental arches. The note in the catalogue says—

> "The central idea has been to give the maximum cubical contents for the least possible expense compatible with good construction and the selection of materials based on the Trust's experience in the erection of some 600 houses on the Bournville Estate.
>
> We have found that the above are essential to the economy of erecting and maintaining small property. The cost limit of 150*l.* entails the most severe external treatment, but we have found that a few years' growth of shrubs and creepers quite eclipses man's efforts at decorating exteriors, if proportional treatment be maintained throughout."

This is sound common-sense, and this is a common-sense building. It might be possible to give a little more character to it without adding to the cost; but we should expect to find that this cottage would be standing and in sound condition long after one like No. 19 had either worn out or cost a good deal of money in repairs.

No. 22, designed by Mr. Whitbread (Carlton, Nottingham), is intended "to meet the requirements of By-laws based on the Model By-laws of the Local Government Board." The walls are of 9 in. brickwork, rough-cast on the upper story. It is very well planned, the entrances to rooms being grouped round a little entrance hall. There is only one external entrance door, which is sufficient as planned, and no room has more than one door in it (we see small rooms in some of these cottages with three or four doors in them). There is a small bath-room on the ground floor, placed so as to get hot water from the scullery copper. This is a very creditable attempt, one of the best in the exhibition. The cottage by "Ealing Tenants Ltd." (26) has something of the same character as the Bournville Trust Cottage, but the water-closet opening by an internal door from the scullery is most objectionable. In these small houses the water-closet or earth closet should always be entered by an external door; it is impossible for it to be quite sanitary otherwise. Even the water-closet opening from a small porch without a door, as in Mr. Allen Foxley's cottage, No. 27, is in too close contiguity; but this last is a simple and sensible design in the main, and the architect is right in his judgment that the average workman (this is a town cottage) resents features that others might call "quaint" or picturesque; and that materials and methods of construction should be used with which all builders and their men are familar; the employment of unusual features "involves close and continuous supervision of the workmen employed, difficult even on large jobs, and almost impossible on works of this size." The block of three cottages (31) exhibited by Mr. Ivor Tucket and designed by Mr. Curtis Green has the merit of simplicity; the walls are 9 in. brick limewashed, with dark green woodwork; this procures what is now a favourite effect in "æsthetic" cottages, of dark details against a mass of white; but limewash does not add materially to the weather-resisting qualities of a 9-in. wall, as rough-cast or some such covering would. The planning is rather naïve; the three cottages differ, but they all have the water-closet opening internally out of the scullery, a fatal objection; and in the bedroom plan part of the space is sacrificed to a passage, owing to the arrangement of walls and stairs. The two-cottage block by the same architect, but exhibited by Mr. Gooch (32, 33), has the same exterior character but is better planned and altogether a good exhibit. The cottage (34) designed and exhibited by Mr. C. A. Agate (Manchester) has merits of somewhat the same nature, and is a pleasing and fairly economical little building. In regard to the remark that the cottage is self-contained, "without any outbuildings and their attendant backyards, which only encourage untidiness and squalor," there may be truth in this, but the "little covered yard," a small arched lobby without a door, is not quite sufficient to separate the water-closet from the scullery door, though it is not so objectionable as a direct opening from the scullery.

Messrs. Potter & Co. exhibit in two blocks (both numbered 35) examples of what they think can be done with concrete for cottages. One of these is of simple concrete, the other, a two-cottage block, of steel construction filled in with concrete, plastered inside and rough-cast outside. The outside finish in both cases is of a disagreeable grey tinge. The two-cottage block is a one-story building with a high red-tiled roof with very wide eaves. It would have been more to the purpose, as they were dealing with steel and concrete, to have shown how well this material would have answered for a flat roof; but we imagine that in this and other cases the high red-tiled roof is used because its effect is supposed to be attractive to the

possible purchaser or client. The plan of these houses is of the most naïve description; scullery 12 ft. by 8 ft., with bedrooms 10 ft. by 9 ft. 6 in. and 10 ft. by 8 ft. 6 in., just because the walls fell in with that; and one of the bedrooms is entered through the scullery. The firm should have got an architect to make them a plan, and they might then have made a more useful contribution to the show. The next exhibit (36), designed by Mr. W. Moss Settle for Messrs. Gradwell & Co. (Barrow-in-Furness), is interesting as a specimen of genuine half-timber work—solid oak posts grooved for 3-in. compressed cement concrete slabs: a lesson at all events for the employers of sham half-timber work. The concrete slabs seem as solid and impervious as could be wished, but one is afraid there may be trouble with all this joint-line between timber and concrete. The plan shows a kitchen and living-room of equal size, the kitchen performing also the function of scullery; this is a more expensive plan than a fair-sized kitchen which forms the living-room, and a small scullery separate; is it a better one in other respects? There are arguments in favour of either arrangement, but we think that for the smallest class of cottage the kitchen must be the living-room; it is so in most small country cottages, and people who live in small cottages are used to it. As to this one being built for 150*l*., or even "repeated for 165*l*.," as promised, we have difficulty in believing it. The construction is one which, simple as it is in one sense, would require very careful workmanship.

Messrs. Harrison & Hattrell's design (37) for a cottage with brick walls rough-cast looks simple and suitable, but as it was locked we could not form a decisive opinion on it. The Cement Products Company show a rather large cottage built of 10-in. and 8-in. hollow concrete blocks, a very good construction; but when they say it can be duplicated for 148*l*., we presume that means the carcase, without any finishing; at all events, we should not advise anyone to order such a house in the faith that it could be done for that sum, ready to be furnished and inhabited. The Fireproof Partition and Spandrel Wall Company exhibit a house (40) in their system of construction; the walls are described as of brick on edge reinforced with ironwork and built in cement, and self-supporting (they do not say over what bearing), so that foundations are required under the stanchions only. The construction in this house appears to be a wall (as just described) inside, and a thin wall of rough-cast concrete on steel lathing outside, with a space of about 6 in. between; a piece of the outer skin is left open to show the structure. This seems rather complicated; we can hardly believe that it is cheaper than 9-in. brick rough-cast, and we do not like large hollow spaces in the walls which can never be got at.

Some exhibits which have nothing very special for mention we must pass over; and the two buildings by the Expanded Metal Company (47) were in too unfinished a state to judge of. Messrs. J. A. King & Co. were erecting a one-story cottage (48A) with walls and partitions of "Mack slabs" 4 in. thick, the outer walls covered with rough-cast. This is well planned, with no space lost; the rooms all open out of a little central lobby top-lighted (this looks like a fixed skylight—it ought to open), and no space is lost, but the water-closet door ought to be round outside and not where it is. The Mack slabs, which (our readers may remember) are slabs of a fine concrete with circular vertical spaces inside, which are filled up (we believe) with liquid cement after they are in position, seem to form one of the most solid of the types of thin walls which it is proposed to substitute for brick, and as they are in large slabs and with finished surfaces there is considerable saving in labour in comparison with brickwork; also some saving of space, and they may be more impervious to weather than a 9 in. brick wall unprotected externally, but that can only be decided by practical experience. The same firm are erecting another block (48b) of which they say in the catalogue, "the outer walls, to the height of the first floor window sills, are of *Mackolith*, a material composed of Mack slabs faced with tiles to represent brickwork." We did not see this effect; the building was probably not finished. This is absurd; it is all right to face them with tiles for a better effect, but why imitate brickwork?

The British Uralite Co. exhibit a pretty-looking cottage externally (53: it was locked up) of which the walls are described as "studding covered with Uralite Kent board both sides, painted and sanded externally, and whitened internally." But what is between the inner and outer boards? Is it hollow space, or is it filled in with anything; and if so, with what? Anyhow, we do not think this is a system for anything but a temporary or summer cottage. Passing over some others not worth special notice, we come to the house built by the "Concrete Machinery Co." (58) stated to have been built where it is for 150*l*., though the representative of the firm admitted that they would not undertake to rebuild it for actual use for that sum, which in fact seems absurd at a mere glance. It is built of concrete blocks, which were made on the spot by a very simple hand-worked machine; large blocks, with two hollow spaces which, in setting, form continuous vertical spaces, the right-hand space in one block corresponding to the left-hand one in the block breaking joint with it. Thus we have a wall honeycombed with vertical tubes; the process saves material and may conduce to warmth, but on the whole we would rather these hollows were grouted up. This is, however, a cheap walling, and not thin or flimsy, and as such deserves attention, and it looks almost as well as coursed stonework. The design is a simple parallelogram with a hipped roof, and looks perfectly well; the plan is very good except for the fact that kitchen and living room have similar windows in front facing the road (apparently for external symmetry), in which case either one of them must have too much sun or the other too little. We give a reduction, however, of the plan and view of this (Fig. 1), as it is one of the best illustrations appended

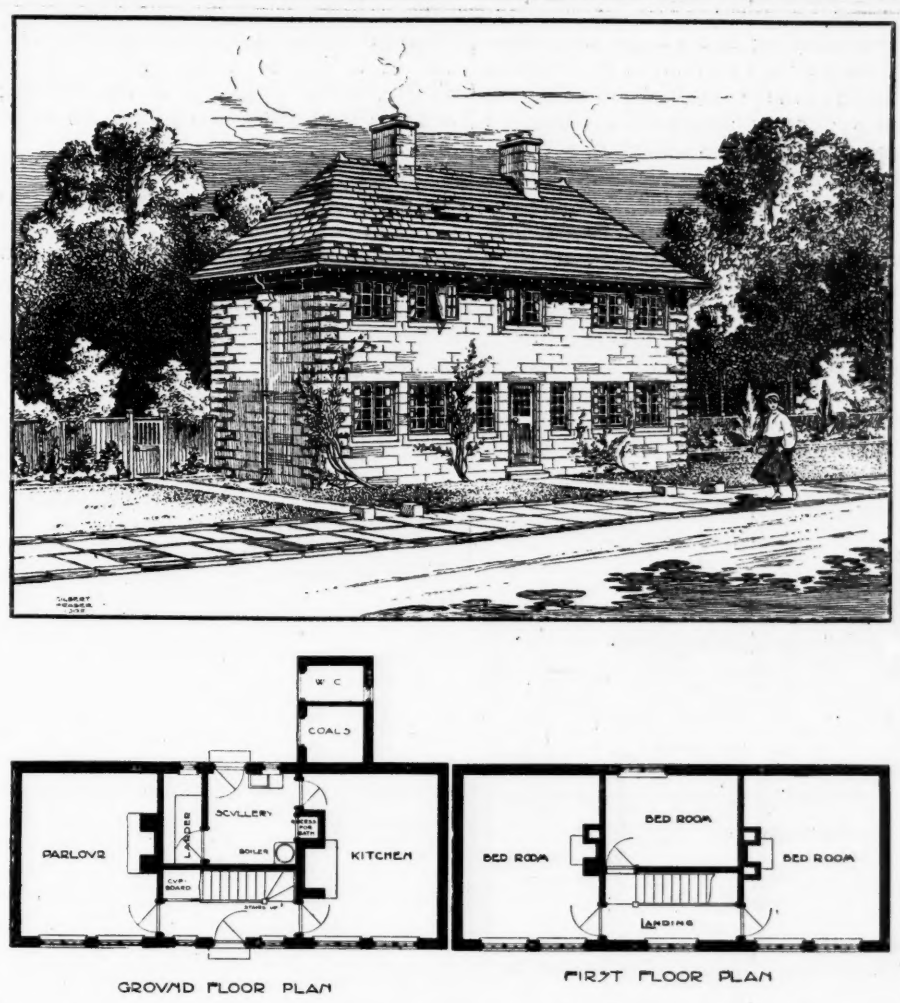

Fig. 1. View and Plans of Cottage (No. 58) by the Concrete Machinery Co. Mr. Gilbert Fraser, Architect.

to the catalogue; but at the same time we must say that we cannot regard it as a solution of the problem of providing the smallest class of agricultural labourer's cottage; it belongs to a class of cottages a grade above that. Messrs. Clare & Ross's one-story cottage (59), on the other hand, seems to come nearer to what is wanted than most of them, if their small kitchen, 8 ft. by 8 ft., which also fills the function of a scullery, can be accepted. They provide a pretty large living-room with an ingle-nook, and a large fireplace with a range, which has a back opening into the kitchen; we give the plan (Fig. 2).

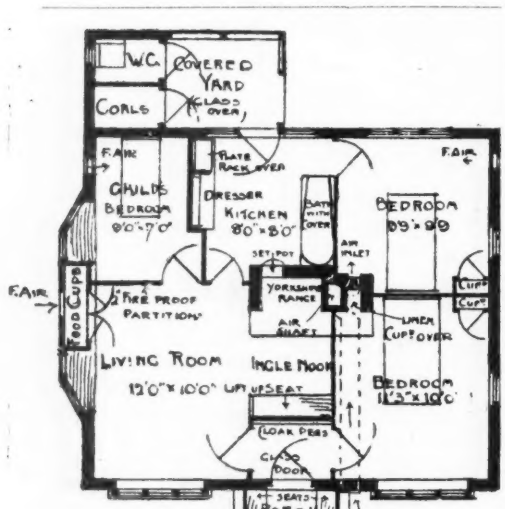

Fig. 2. Plan of One-story Cottage (No. 59). Messrs. Clare & Ross, Architects.

Most of the cooking would obviously have to be done in the living-room, so that what is called the kitchen after all becomes practically the scullery. The walls are described as of breeze concrete 7 in. thick, "fitted in between a special system of lattice skeleton framing." The partitions and ceilings are in Mack slabs; "floors and partitions absolutely solid, and no unseen spaces below the ceiling where vermin can harbour"; which is also a good point. It is almost amusing to find the author of No. 61, on the contrary, specially advocating hollow spaces and describing the upper part of the walls as "timber framing plastered inside and out, thus *leaving a hollow space* and ensuring dry and healthy rooms": a most undesirable form of construction. How could one tell what may be accumulating in those "hollow spaces" between two sheets of plaster?

One (the nearest) among the outlying cottages we went to see, having received a special card calling attention to it. This is a pair of semi-detached cottages designed by Mr. Baillie Scott, at a cost price stated as 420*l.* for the pair. This is a very picturesque building, and planned inside in a manner both pleasant and practical. One of the cottages has been filled with a collection of old cottage furniture, not all of it presenting models worth repeating, though they look very nice here; for instance, an old four-post bed has been put in one of the rooms, an unhealthy form of furniture which ought to be considered as rightly extinct, and only historically interesting. The small forecourt to the cottages is prettily laid out in a simple form of ornamental paving, with a sundial in the middle; but this part of the work does not come into the 420*l.*

On another occasion we will consider the outlying cottages, and some of those which are not yet finished. By that time there ought also to be available a new and revised edition of the catalogue, which, although very well laid out, has still some inaccuracies and omissions to be set right.

NOTES.

Overhead Traction for Railways. THE narrow escape and difficult rescue of two youths from a live rail on a Lancashire railway point to the dangers lurking in the unprotected third rail. One of these youths, by accidental contact, became glued to the line, a friend who attempted to disengage him was also caught in the toils, and the two were only dragged off in time to escape being cut up by a passing train. An alternative method of traction, which obviates such risks, and promises to reduce both capital cost and maintenance by nearly one-third, is one embodying the use of single-phase alternating current motors in connexion with overhead conductors. At the same time it avoids the possibility of disorganisation during times of flood that attaches to the third-rail system. Single-phase motors have been in practical use for more than a year on the Ballston extension—about 11½ miles long—of the Schnectady Railway in the United States, and, so far, the results appear to be quite satisfactory. This method of traction deserves careful investigation by railway authorities, for it certainly possesses advantages over the prevailing system, and should do much to hasten the electrification of steam railways and, we may add, to encourage tramway and light railway construction in country districts.

Sanitary Authorities and Compulsory Powers. THE case of the Attorney-General *v.* Corporation of Dorchester is one of extreme importance, but, as at present reported, is somewhat difficult to follow. The action was brought by the Attorney-General at the relation of Mr. Talbot, who was also a plaintiff, in respect of a nuisance created by the defendants' sewage works, and the defence was that the works were properly carried out under Provisional Order and statutory authority. The defendants are the sanitary authority acting under the provisions of the Public Health Act, 1875. In 1900 the defendants were seeking to enlarge the limits of the borough, and the co-operation of the Local Government Board seems to have been obtained with the condition that the Corporation should carry out a system for the disposal of the sewage, which works were to be approved by the Local Government Board, and the Provisional Order provided that, in the event of the Corporation not proceeding to carry out such works within the period limited, then they could be compelled to do so under sect. 299 of the Public Health Act, 1875. The finding of the Court appears to be that this Order only compelled the Corporation to carry out the proper works in exercise of the powers conferred upon them by the Public Health Act, 1875, and that the statutory obligation did not extend to carrying them out according to the plans submitted and approved, and that therefore, under sect. 27 of the Public Health Act, 1875, the powers must be executed in such a way as not to create a nuisance. The court found as a fact that the works did cause a public and private nuisance, and therefore the plaintiffs were entitled to succeed. There was also a subsidiary question as to whether the defendants had infringed sect. 17 of the Act by discharging sewage insufficiently purified into the river Frome, but this cause of complaint, though existing at the time action was taken, had since been discontinued.

The Strength of Reinforced Concrete. DURING the last two years more than two hundred scientific tests of concrete-steel beams have been conducted at various institutions in the United States. With the object of making a comparative study of these tests, Mr. T. L. Condron has calculated, for each beam included in the above-mentioned tests, the ultimate bending moment and the percentage of reinforcement. The results so arrived at are stated in a series of diagrams to be found in a paper recently read before the Western Society of Engineers. The data presented by the author are perhaps more useful than the conclusions drawn by him, and the discussion evoked by this communication was particularly valuable, including contributions from two or three leading American authorities on the subject. This paper is in marked contrast with the purely descriptive treatment of concrete-steel which characterises several papers read lately before British engineering institutions, the members of which ought by this time to be prepared to discuss the principles of construction in a mutually helpful manner.

Compensated Meters. MR. A. CAMPBELL, of the National Physical Laboratory, has communicated to the *Journal* of the Institution of Electrical Engineers an important paper on the compensation of ammeters for measuring electric currents. It is well known to experts that practically all shunt ammeters are affected with serious temperature errors. Owing to the resistance of the coil of wire which forms part of the instrument varying considerably with the temperature of the coil and to the difficulty of determining its real temperature, the accurate measurement of current is almost impossible. Mr. Campbell gets over this difficulty in an exceedingly ingenious manner. Making use of the fact that the resistance of coils of wire made from certain metals vary in different ways, he has designed an arrangement which compensates almost perfectly for changes of temperature. An instrument fitted with this compensator was found to read correctly, although the temperature was varied from 67 deg. to 98 deg. Fahr. In the latter part of the paper formulæ are found for taking into account the effect of shunting a broad strip of metal by a galvanometer connected across two points of the strip. The problem is one

of extreme difficulty, and has hitherto been attacked only by the application of the most advanced analytical methods. The author, however, by using a general theorem on the reciprocal relations between current and pressure, has found the correct solution in an exceedingly simple way. A particular case of the general theorem he uses was proved by Kirchhoff, but it is to Lord Rayleigh we are indebted for the complete development of the reciprocal relations between physical quantities. These relations are useful in practical work not only in simplifying the calculation of formulæ, but also in suggesting new instruments and new methods of testing. To continental electricians the "method of duality" is well known, but it has been mainly applied to developing reciprocal relations between dynamos and motors. Mr. Campbell has shown how useful it can be in the testing-room.

Changes in Lombard-street, E.C.

THE Court of Common Council have adopted a scheme propounded by their Finance and Improvements Committee for an improvement to be caused by the re-building of Nos. 1 to 6, Lombard-street, between Mansion House-place and St. Swithin's-lane. The former Nos. 1-10, on the south side of Lombard-street, were, together with Dove-court and Little Lombard-street, pulled down for the laying-out by William Mountague, the City architect, of King William-street in 1824-30. The present block, consisting of Nos. 1-6, was then built after plans and designs by Sir Robert Smirke, R.A. No. 1, Union Bank of London and Smiths, stands on the site of a house, occupied, by the sign of the Angel, by John Lindsay, goldsmith, before the Great Fire; as rebuilt after the fire it became the banking-house, by the sign of the Cock, of Harley & Co., into which Smith, Payne, & Smiths, founded in the Midland provinces by Thomas Smith in 1688, removed at the close of the XVIIIth century, their London house having been established in 1758 at No. 18, Lombard-street. No. 18, by the signs in the XVIIth century of the Hare, and the Hat and Harrow, was bought from them in 1782 by the now Phœnix Fire Assurance Co. In July, 1902, the firm was amalgamated with the Union Bank of London. Twenty-five years ago, during some alterations at No. 1, was found a cast-iron slab, bearing the device of a cock and figures "1652." In next autumn will be offered for sale the freehold property, Nos. 80-1, which stands nearly opposite, on the site of houses distinguished in turn, as Mr. F. G. Hilton Price records, by some of the oldest signs in the street—the Seven Stars, the Saw, the Heart and Crown, the White Horse, and the Halbert and Hart. The premises, latterly Brooks & Co.'s banking-house, were (with No. 82) re-built after designs of Edward I'Anson, and are held on lease for a term of eighty years from Lady-day, 1855, at a ground-rent of 500*l.* per annum.

Changes in the Strand.

THE premises of the *Morning Post* in the Strand will shortly be vacated for new buildings, designed for Lord Glenesk by Messrs. Mewes & Davis, upon an adjoining plot of land abutting upon Aldwych and Exeter-street. The present offices of that paper, at the angle of the Strand and Wellington-street, were erected after Mr. H. O. Cresswell's designs—illustrated, and with two plans, in the *Builder* of February 18, 1893—upon the site of a house, No. 346, Strand, which was built in 1838 from designs by S. Beazley. That house, latterly the offices of the *Queen* and *Field* journals, supplanted one which had been the noted shop of A. Walker & Co., formerly D'Oyley's, standing on the site of Wimbledon House. Wimbledon House was built by Sir Edward Cecil, first Viscount Wimbledon, son of Thomas, Earl of Exeter, and grandson of Lord Burghley, from whose adjacent town mansion Exeter and Burleigh streets derive their names. D'Oyley gave his name to a once highly-popular fabric, a union of silk and wool, for cloths, towels, and other small-ware articles, as well as to, it is said, the little dessert or wine-glass napkins commonly so called; though he may have adapted that name from the low German *Dwihle* or old high German *Dwahilla*, the English "towel." Gay cites "thy D'Oily habit" in his "Trivia," book I.; similar allusions are made by Dryden, Budgell, and Steele, and in Moser's "Vestiges." A site has been cleared at the corner (west) of the Strand and Milford-lane for the new premises of the United Kingdom Provident Institution, of which Mr. H. T. Hare is appointed architect. The former buildings on that site included No. 198, where, on May 14, 1892, the *Illustrated London News* completed the first fifty years of its publication. An attic in the adjoining house, now pulled down, was the studio of Charles Keene, of *Punch*.

SOME ENGINEERING WORKS IN BELGIUM.

MUCH attention is being directed to Belgium this year as a result of the Liège International Exhibition, the visits of the Institution of Mechanical Engineers, and the South Wales Institute of Mining Engineers, the Convention of the International Congress of Mining, Metallurgy, Mechanics, and Applied Geology, the meeting of the International Congress of the Chamber of Commerce, and the fêtes organised by the Government to commemorate the seventy-fifth anniversary of the national independence.

Some of these functions have already taken place, and many British engineers have availed themselves of the opportunities thereby afforded for studying the most recent developments that are to be found within the boundaries of a country which enters into friendly competition with us in various departments of industry. For a few years past the bugbear of American competition has been on the nerves of many people in Great Britain, and some seem to think that the only hope for British manufacturers is to mould their practice on that of the United States.

Numerous visits have been paid to that country, and voluminous accounts have been published of the wonders to be seen in the engineering and kindred works there to be found.

No doubt all this has done good. We must point out, however, that it is equally important to know what is taking place nearer home. Belgium offers a favourable field for the purpose of such an inquiry owing to facility of access and the compact grouping of its engineering industries in the Walloon district. No better centre than Liège could be selected for a tour among the mines and ironworks of Belgium, for that town is literally founded on coal, and is in the midst of a region rich in other mineral resources. In some of the suburbs coal crops out at the surface, and it has been found necessary to prohibit the working of mines extending below inhabited districts. The development of Liège is said to have been due, in the first instance, to the discovery of coal by a blacksmith named Hullos, whose name has given the French word "houille," which distinguishes coal in the seam from "charbon," or coal in its commercial form.

The coal concessions in the province of Liège alone cover an area of nearly 100,000 acres, and provide employment for fully 35,000 men. Among the most interesting undertakings of the kind is the Charbonnage du Hasard, having pits at Micherot and Fléron. Electric winding machinery has been adopted with considerable advantage at the last-mentioned pit, power being furnished by a central station containing three sets of 300-h.p. three-phase generators. These sets also provide current for pumping, ventilation, coal cleaning, and other plant.

Electrically-driven winding machines have also been installed at the St. Nicholas pits of the Espérance and Bonne Fortune collieries, Montegnée. This winding plant is capable of raising 500 tons from a depth of 800 metres in eight hours, and has replaced a steam-driven machine, with the result that the company have saved the expense of renewing a battery of six boilers, and have effected a considerable reduction in wages.

Although the data at present available do not appear to prove that electrically-driven winding machines are invariably superior in point of economy to steam-winding engines, their advantages are sufficiently demonstrated at the pits of St. Nicholas, where the establishment of a central power station and the distribution of energy therefrom to different points is far more economical than the previous methods of employing separate boiler and engine houses.

Some of the largest collieries in the province belong to great iron and steel works, to which we shall make reference a little later. Thus the Société Ougrée-Marihaye use nearly 275,000 tons of coal a year. This company own five collieries, with an output of about 860,000 tons a year, and covering an area of 4,025 acres, beneath Flémelle, Yvoz-Ramet, Chokier, Val St. Lambert, and Seraing. The system of working is noteworthy for the reason that the use of explosives has been entirely displaced by mechanical appliances, the Dubois-François driver being largely employed. This apparatus first drills a hole in the coal, and afterwards drives in a multiple wedge of circular cross-section, by which a large mass of mineral is detached. The colliery department includes seventy-one Ssmet-Solvay coke ovens and sixty-eight coke ovens of the Collin type, about half of the latter being at the Seraing colliery. Extensive workshops are also provided for the screening and washing of coal and the manufacture of briquettes. A sixth colliery, with an area of 690 acres, is situated near the blast furnaces of the company. In this department there are ten Appolt system vertical ovens, each with sixteen retorts, and three Bernard system horizontal ovens, each with forty retorts.

The Société John Cockerill are also extensive colliery owners, having a concession in the Meuse valley occupying 750 acres. The Colard pit is the most important, yielding about 2,000 tons of coal a day.

Ventilation of the workings is effected by an electrically-driven Mortier ventilator, with an exhaust capacity of 1,400 cubic ft. of air per second. Well-appointed bathrooms are provided in the buildings at the brow of each pit, a convenience which is much appreciated by the miners.

Many of the other collieries in the Liège district have entered into the combination known as the "Union des Charbonnages, Mines, et Usines Métallurgiques," founded in 1866, the total output of the province being about 6,500,000 tons a year. Including mines in other provinces, the total coal production of Belgium, in 1904, was 23,500,000 tons, giving employment to 135,000 miners.

The most important of all the industrial firms in Belgium is the historic Société John Cockerill, whose property includes the

immense works at Seraing, a dockyard at Antwerp, collieries in the Meuse valley, iron mines at Rumelange and in the Grand Duchy of Luxembourg. The company are part proprietors of iron mines in German Lorraine, in French Lorraine, and Bilbao, in Spain. Further, in addition to lighters and steam vessels on the Meuse, they own a fleet of nine cargo steamers, three of 300 tons built for a daily service between Ostend and London, and six, including two of 2,400 tons and four of 4,000 tons, calling regularly at different ports in Spain, Italy, Tunis, and Algiers.

Seraing stretches for about a mile along the right bank of the Meuse, and is connected by a suspension bridge with Jemeppe, about three miles from Liège. John Cockerill, the founder of the Seraing works, was also the founder of modern engineering in Belgium. The son of an English emigrant, he established a small factory at Liège in 1802, and, in 1817, his great mechanical genius was recognised by the King of Holland, who granted to him the old Château des Prince-Evêques de Liège, together with its dependencies and grounds, for the establishment of works to be devoted to the manufacture of engines and machinery, particularly for the flax-spinning and mining industries. We may here explain that the Château of Seraing should not be confounded with the later seat of the prince bishops, built on the Place St. Lambert, Liège, during 1508-1540. Both buildings still remain in excellent preservation, and the world has to thank Cockerill and his successors for maintaining the old Château of Seraing very much as it was except in the matter of environment. The mansion is now used as the residence of the managing director and for the chief offices of the company. Around the Cour d'honneur occupying the centre are the offices of the manager and secretary, the sales and buying departments, the offices of the accountant, the archives, and the library. The offices of the engineering department occupy the first floor of a building forming one wing of the old Cour de Service, which we regret to find has been transformed into a workshop. However, the ancient council hall of the States-General of the Liège Principality has been preserved intact, and is used as a board-room and meeting-place for shareholders. The château stands close to the bank of the river, and, with its adjoining park and gardens, still maintains some appearance of its mediæval grandeur.

In 1824, a coke-fired blast furnace was erected at Seraing, and, although not actually the first built on the Continent, it was the first to be provided with a blowing engine. So excellent was the working of this furnace that it may justly be said to have revolutionised pig-iron manufacture on the Continent. Between 1825 and 1827 Cockerill and his associates turned attention to the design of steam vessels with high-pressure boilers and compound condensing engines. In 1835, the first wrought-iron rails made on the Continent were rolled at the Seraing works, and the first locomotive built on the Continent was turned out for the Belgian State Railway. After the death of John Cockerill, in 1840, his nephew, Gustave Pastor, formed a limited company to continue the business, which has steadily progressed until at the present day the Seraing works alone cover an area of nearly 300 acres, and provide employment for about 10,000 men. The growth of the Société Cockerill has continued side by side with the development of the Belgian engineering industries, which owe much of their reputation in foreign countries to the admirable design and high-class workmanship of the products turned out by the Seraing works. Although other establishments on the Continent now exceed them in point of size, these works possess a historic interest which is unique, and an unsurpassed interest to the practical engineer owing to the varied metallurgical and manufacturing arts conducted under one management.

In addition to the production of coal and iron, the company are extensive makers of steel rails, joists, bars, and plates; iron and steel castings and forgings; marine, stationary, and locomotive engines; gas engines, steam boilers, bridges, and structural work, iron and steel wheels and axles, gun carriages, ordnance and projectiles. They have devoted themselves particularly to the manufacture of compressed-air plant, the production of blast-furnace gas engines of large powers, the manufacture of steam turbines, and the building of steamships, and, at the present time, they are actively engaged in studying the application of superheated steam to locomotive design—one of the most recent developments in railway engineering.

Throughout the works ample evidence is presented in every department of the fact that the management have fully appreciated the necessity for continued improvement in the plant. Several of the shops have been rebuilt and others re-equipped within recent years with machinery of the latest types. Electric cranes are everywhere to be seen in the shops and yards, electric and hydraulic tools are freely employed in the boiler and other shops, the latest types of blast furnaces, and 1,500 h.p. by steam engines. The blast-furnace gas engines are taking the place of steam engines and boilers for blowing and for the generation of electricity. In the central generating station 1,800 h.p. are provided by engines utilising gas from the furnaces, and 1,500 h.p. by steam engines. The latter, with their generators, formed the equipment of the original central station built in 1889. This machinery will shortly be replaced by a 1,500 h.p. furnace-gas engine generator now under construction in the works.

The foregoing brief notes show that the company are fully alive to the necessity for keeping abreast with the times. It is satisfactory to find that they also recognise the duties they owe as modern successors to part of the ancient principality. The industrial school of Seraing owes its creation to the initiative of the Société John Cockerill, and several of their engineers take part in the instruction there conducted. A school of mining has also been established at Seraing. A hospital was founded in 1849 after an epidemic of cholera, and, in 1866, an orphan asylum was added to the institution, which now contains 230 beds, and provides for the gratuitous treatment of patients. There are also on the works an infirmary for first aid in case of accidents, and a surgery whence medicines are supplied without charge to workmen and their families. Five physicians are retained who attend daily at the works and at the dwelling-houses of employés who are sick or otherwise disabled. The works also comprise well-appointed mess-rooms for men who live too far away to enable them to take their meals at home.

We may add, in conclusion, that the network of railways within the boundaries of the Seraing works has a total length of forty-seven miles, all the lines being of standard gauge. The rolling stock includes thirty-five locomotives and 530 vehicles for the transport of coal, coke, ore, slag, and finished goods. For transport on the Meuse a steam-tug, six lighters, and two steam barges are maintained, the lighters and barges having a capacity of 300 tons each.

On the opposite side of the river at Jemeppe are the works of the Société Maison Beer, where an engineering laboratory has been established in connexion with the Liège University. The experimental boiler and engine here provided were those used by Professor Déry for the purpose of his well-known investigation into the thermal efficiency of the steam engine.

Not far off are the Tilleur works of the Société des Aciéries d'Angleur, which comprise eighty-four regenerative coke ovens of the Coppée type, with an annual production of 120,000 tons, four blast furnaces, with an output of 150,000 tons of pig-iron, and three Thomas steel-converters, producing 130,000 tons a year. A new steel plant of four 12-ton converters is now being laid down, and when this is finished the annual steel production of the works will be 250,000 tons. At the rolling mills in the same establishment plant is already provided for making 200,000 tons of girders, rails, and other rolled sections. Bridges and constructional steelwork receive attention in another range of buildings, which includes shops for the manufacture of railway and tramway switches, points, and permanent-way material generally.

Electricity is extensively employed in these works for transporting materials and for driving machinery, among which may be specially mentioned the mills for grinding basic slag to be used in the manufacture of cement and artificial manure. The Angleur works of the same firm, a little nearer to Liège, are devoted to the production of Bessemer and Siemens steel by the acid and basic processes and the rolling of structural sections and bars. The works also contain shops for the manufacture of axles, tyres, and springs. About 3,000 men are employed at the two establishments of the company.

On the opposite side of the Meuse, near the Ile des Corbeaux, are the blast furnaces and steelworks of the Société Ougrée-Marihaye, the ground covered by the furnaces and yards being fully 54 acres and the steelworks 91 acres, independent of 214 acres reserved for extensions and partly occupied by the dwellings of workmen.

The first department includes four furnaces, each with an output of about 75 tons a day of 24 hours, all these being built in a straight line and fed by an electric overhead traveller. A fifth furnace of 100 tons capacity was blown in this year. The furnaces are blown by four Cockerill engines, two working with steam and two with blast-furnace gas. At these works a large Temperley transporter has been installed, which, we believe, is the only appliance of the kind hitherto introduced into Belgium. The central electricity station is provided with three 600-h.p. generating sets operated by steam, and arrangements are now being made for the addition of two 1,200-h.p. furnace-gas engines and generators.

The steelworks, situated a few hundred metres away, contain a 100-ton mixing machine, three cupolas, four 12-ton Thomas converters, two 15-ton Siemens-Martin furnaces, and several large rolling mills for rails, beams, plates, and bars. The largest mill is driven by a 10,000-h.p. condensing engine, and two small mills are driven by electric motors, one of the first applications of the kind in Belgium. Here, also, a large shop is provided for crushing basic slag for cement and other purposes. The Ougrée-Marihaye Company has recently entered into amalgamation with the smelting works of Vireux and La Chiers, in France, and of Rodange, in the Grand Duchy of Luxembourg, thus acquiring a most prominent position among the greatest industrial undertakings of the world.

Sclessin, on the bend of the river which turns northwards to Liège, is the seat of numerous engineering works. Here, in succession come the Fonderies Ketin, where castings for the largest rolling mills and for engines and machinery are produced on a large scale, and up to 100 tons in weight; the cut-gear works of M. Recq de Malzine; and the Ateliers de la Meuse, where locomotive and stationary engines, winding engines, mine pumps, and machinery for iron and steel works form the staple articles of manufacture. Here, also, is the Usine Electrique du Pays de Liège, where current is generated for the Communal tramways of Liège and for distribution to works and districts between Liège and Huy.

This station has been erected and equipped within the short period of six months—an achievement of which people in Liège are justifiably proud. The station is furnished with two Parsons turbines of 2,500 h.p. each, built by the Société John Cockerill, direct-coupled to alternators supplying 500-volt direct current to the Liège tramways and 6,000-volt current to Seraing and other places on the Meuse. The engine-house as built is intended for the reception of generating sets up to 20,000 h.p., but the plan provides for future extensions up to 100,000 h.p., so that when the scheme has been completely developed this establishment will take rank with the largest power stations in the world. The boiler-house comprises an installation of Galloway-type boilers, made by the Chaudronneries Piedbœuf, and is supplied with the most approved types of apparatus for stoking and the disposal of ashes.

Near Angleur, in the valley of the Ourthe, are the works of the Société de la Vieille Montagne, a company which owes its origin to the Vieille Montagne at Moresnet to the north-east of Liège. The deposit of calamine, or carbonate of zinc, in this place formed the subject of a concession dating as far back as the year 1435. In 1795 the mines were worked by the Government of the

French Republic; in 1806 the Emperor Napoleon granted them to a Liège chemist named Dony, on condition that he should inquire into the possibility of producing zinc in the metallic form. To Dony the world owes what is termed the Liège method of reducing zinc ore by distillation, the principle of which remains to the present day. The Société de la Vieille Montagne was founded by the successors of Dony, in 1818, the property then including the mines at Moresnet, a foundry at Liège, the works at Angleur, and two rolling mills in France. Since that date the operations of the company have been widely extended in various countries, but the chief offices still remain at Angleur.

Besides its interest as the starting-point of the world's zinc industry, Moresnet has other claims to the attention of engineers. It was here that Wolf installed his first compound pumping engine, and Clay his first rotary pump. The company were the first to make crucibles by machinery and to apply zinc sheets to the roofing of buildings.

Passing into Liège itself, numerous evidences of industrial activity are presented to the inquiring visitor. From an early period in its history the prosperity of the town has depended very much upon the manufacture of firearms. Thousands of men, women, and children occupy themselves even to-day in making parts of guns and rifles in their own homes. The most important place of manufacture on modern lines, however, is at Herstall, about three miles from the centre of the town, where are the works of the Société des Fabricants d'Armes de Guerre Réunis, this establishment being well laid out and equipped with automatic machinery of recent type. To avoid discontinuity of work owing to the intermittent demand for weapons of war the company have recently undertaken the manufacture of sporting guns, bicycles, motor-bicycles, motor-cars, and other articles of less deadly character for which their machinery is well adapted. From 1,500 to 2,000 persons are occupied in these works.

An extensive organisation connected with the electrical industry is the Compagnie Internationale d'Electricité established in 1889. The operations of the company have been extended to several foreign countries, where works have been built, all affiliated with the parent establishment. The first overhead electric tramway-cars in Belgium were built by this company, by whom numerous power stations for traction and lighting have been equipped in various continental towns.

The Société St. Leonard is another firm which is closely associated with the industrial development of Liège and of Belgium generally. Started in 1825 by Regnier-Poncelet for the manufacture of steel files and small tools, their operations were successively extended to machine tools, marine engines, mining pumps, and locomotives. The first steam engine designed in their works was built in 1836, and the first locomotive in 1840. In 1877, they introduced steam traction on urban tramway systems, and in more recent times have turned attention to gas-engine construction, being now prepared to erect and test engines up to 2,000 h.p.

It would be easy to fill pages by referring to the many other large works in Liège and its immediate vicinity, but we have written enough to demonstrate the remarkable enterprise displayed in this industrial centre. At the same time, technical education is not neglected. The University of Liège, founded in 1817, is attended by 1,600 students, under sixty professors, and affords to engineering students the opportunity of gaining both theoretical and practical training. The technical departments cover mining, arts, and manufacture, mechanical engineering, and electrical engineering, the tuition of electrical students being conducted at the Electro-Technical Institute, founded in 1885. In addition to the University, Liège now has a school of mechanical engineering, opened in 1902, and attended by about 400 pupils. This institution is well equipped with machinery, and is specially intended to train youths for entrance into engineering workshops.

Further evidences of industrial activity are to be found in the adjoining provinces of Hainault, Namur, and Luxembourg, where there are many important coal, iron, zinc, and lead mines, iron and steel and general engineering works, and quarries yielding marble, granite, slate, and other building stones. One of the largest establishments in the arrondissement of Charleroi is that of the Société de Marcinelle et Couillet. The works of this company date from the early part of the nineteenth century. In 1821, puddling furnaces were equipped on the English model at Couillet, and during the next year a blast furnace was built at the branch works of Hauchies. In 1828 blast furnaces were erected at the Couillet works, and in 1834 the rolling mills were equipped on an extensive scale. In 1889, the manufacture of steel was commenced on the Siemens-Martin system, and in 1892 the Thomas system was adopted. Continued extensions took place until the works of the company covered a total area of 178 acres, including establishments at Couillet and Châtelineau for the production of iron and steel and the manufacture of blooms, billets, rails, bars, sleepers, locomotive, stationary engines, war material for artillery, and fortifications, bridges, constructional steelwork, and motor vehicles. Moreover, the company own coalpits extending over nearly 5,000 acres, and have concessions for working iron ores in various parts of the country as well as in France and Grand-Ducal Luxembourg. As in the case of other large Belgian corporations, the Société de Marcinelle et Couillet are not unmindful of their social obligations. Dwellings have been built, and are let at low rents to workpeople, who are supplied with flour and bread at cost price. Infant and elementary schools have been built for the children of employees, as well as schools for adults for housewifery, drawing, and music, and a technical school for apprentices. There is also a well-equipped accident hospital in connexion with the works, and the company have established a provident institution, affording medical attendance to workmen and their families, advances of money in case of illness, and old-age pensions.

Another striking instance of Belgian perspicuity is presented by the history of the Société des Ateliers Germain. The works at Monceau-sur-Sambre, near Charleroi, were established in 1857 for the manufacture of railway rolling stock which, together with tramway vehicles taken up later, have found their way to all parts of the world. Within recent years the workshops have been extended so as to provide for the prompt execution of the largest orders, and a special factory has been built for the manufacture of motor vehicles. These works are remarkable for their admirable organisation and the perfection of the tools and machinery employed. It is a significant, and, from the British point of view, by no means a satisfactory, fact that the new omnibuses employed by the London Road Car Company have been supplied from these works.

In addition to the thickly-clustered works in the essentially manufacturing regions, large engineering establishments are to be found in and around Brussels and even in the Flemish provinces of Belgium.

A tour of inspection through the works to which we have directed attention in this review will prove a veritable revelation to those who are prone to think Belgian products are necessarily inferior because their price is low. Personal investigation will suffice to show that this is quite a mistaken idea. That mercantile sections of steel and some types of machinery produced in Belgium are inferior to those general in this country is certainly a fact; but such productions are specially intended for buyers to whom price is the first object, and it should be thoroughly recognised that many Belgian engineering firms in the present day are fully equipped with the most perfect modern machinery and scientific knowledge, so that they are perfectly able to compete on level terms with the best talent in our own country. And in their favour also are the frugal habits, the steadiness, and the painstaking character of the Walloon artisan.

Further, the engineering industries of this enterprising country are wonderfully assisted by the cheap means of transport provided by the Belgian State Railways and the splendid system of navigable waterways under Government control, which provide a complete network of internal communications and ready access to other countries. The canal policy of the Belgian Government is dictated by the desire to encourage trade or commerce, and with this object in view more than 15,000,000*l.* have been spent on the improvement of inland waterways and the ports connected therewith. This enlightened policy has undoubtedly been of most material assistance in enabling the Belgian producer to become a successful competitor in the great markets of the world, and deserves to be carefully studied by all who are working for the regeneration of the British canal system.

THE ROYAL ARCHÆOLOGICAL INSTITUTE AT TUNBRIDGE WELLS.

THE Royal Archæological Institute this year fixed upon Tunbridge Wells as the place of its annual meeting, not so much on account of the historical associations of the place, which is hardly, at present, one of antiquarian interest, but because it forms a convenient centre with sufficient hotel accommodation for a large party.

The proceedings opened on Tuesday, July 25, when the Mayor of Tunbridge Wells (Alderman H. Thorpe) met the assembled members at the Pump Room at noon, and accorded them a hearty welcome. The President of the Institute (Sir Henry H. Howorth) then took the chair and proceeded to deliver an interesting address. After commenting on the natural beauties of the district the Institute had come to explore, the President spoke of the wonderful history of the county of Kent, so replete with old abbeys, castles, and primeval monuments. He also referred to the fact that Kent had two cities, two sees, and two cathedral churches (Canterbury and Rochester), a feature that occurred in but one other county (Yorkshire). Sir Henry also briefly traced the history of Kent in the Middle Ages, and mentioned its traditions, its folk-lore, the great tragedy of the murder of St. Thomas at Canterbury, and the splendid poems of Geoffrey Chaucer descriptive of the pilgrims travelling to St. Thomas's shrine. He also pointed out that Caxton was born in the Weald of Kent, and reverted to the place in history that Tunbridge Wells had begun to make for itself as a consequence of the discovery there, in the XVIIth century, of the medicinal springs to which it owed its fame.

After an interval for luncheon, a party of about seventy set out in brakes for Bayham Abbey. Here Mr. W. H. St. John Hope gave an account of the Præmonstratensian, or White Canons, to whom the abbey belonged,* and described the leading features of the ruins. The abbey was founded about 1200, and its remains consist chiefly of the church, the chapter-house, the dorter and frater sub-vaults, and part of the western range, and also of the front of the gatehouse. The church is of special interest on account of the way in which it was enlarged early in the XIVth century, when a new crossing and steeple, with north and south transepts, and an apsidal presbytery were built on to the east of the then existing cruciform church, and connected with it by narrow aisles. At a later date, before the close of the century, the nave was remodelled and furnished with a ribbed vault, with singular vaulting shafts. Mr. Hope referred to the recent judicious stripping of the ivy from the walls by the present Marquess Camden, which enabled various hitherto concealed features to become visible. Mr. Micklethwaite added a few remarks on the difference between the Black and the White Canons, who, in their day, were somewhat analogous to the High and Low Church movements of the present time. The Black Canons favoured elaborate ritual at their services, whereas the White Canons of Bayham were more of the Puritan type, and would have scarcely any carving about their buildings. They took care, however, like the Quakers, that what was introduced should be of the best, and the mouldings and architecture were as good here as could be found anywhere in England. After a vote of thanks to the Marquess Camden for allowing them to visit the ruins, the party returned to Tunbridge Wells. In the evening the Mayor and Mayoress held a reception in honour of the visit of the Institute in the Town Hall, where the members of the

* An illustrated description of the ruins of Bayham Abbey, with a ground plan, will be found in the *Builder* for July 3, 1897.

Natural History Society had also gathered together a number of local antiquities and other interesting exhibits.

Wednesday, the 26th, was devoted first to a journey to Bodiham Castle, which was reached by train about 11 a.m. Here Mr. Harold Sands read a paper in which he pointed out that the castle of Bodiham was probably the best-known English example of the new type of moated, castellated houses which was introduced towards the close of the XIVth century. Bodiham Castle was built by Sir Edward Dalyngruge, who, in 1386, obtained licence from Richard II. authorising him to "strengthen and embattle, construct, and make into a castle his manor of Bodiham, near the sea, in the county of Sussex, for the defence of the adjacent country and the resistance of our enemies." This site possessed considerable strategic advantages over the site of the earlier mansion, which was situated on the other side of the hill, about half a mile to the north. The castle might be said to form the connecting link between the castles of the Plantagenet Period and the fortified manor houses of the Tudor Period. The great north gate had no fewer than three portcullises, a portion of the outer one still remaining *in situ*. The lesser gatehouse was in the south central tower. In front of the south gate, two walls, about 3 ft. thick, projected into the moat. Between them was a bridge pit (now filled up), which received the rear end of a lifting bridge. The outer end of this fell upon a permanent wooden pier, on trestles, extending across the moat (here about 110 ft. wide) to a small tower or barbican, now destroyed. He had always thought that there was a line of exterior defence running round the outer edge of the bank which retained the water of the moat. With regard to the relations of the castle to the Rother, Mr. Sands pointed out that at one time the river was considerably wider and deeper than at present, and quite capable of floating a ship of the period. Returning to the castle, he said the towers had fireplaces and garderobes, showing they were intended for habitation, probably by the soldiers of the garrison. The gatehouse opened into an interior quadrangular court, around which ran a range of buildings. In the south-west angle was the great kitchen of the lord, with three huge open fireplaces and an oven. The great hall was 48 ft. long by 28 ft. wide, with a high-pitched timber roof and a two-light window at the eastern end. At the south-east corner of the court was the site of the main staircase, leading from the basement at the east side to the private apartments of the lord and his family, which extended along the east side as far as the chapel. It was noticeable with all the exterior walls that large windows were found only on the south and east fronts, as being least exposed to attack. Next to these chambers was the chapel, 29 ft. by 19 ft. With some exceptions, the roofs of the buildings round the courtyard were flat, and covered with sheet lead, providing a line of uninterrupted communication on the wall-level. Mr. Sands afterwards called attention to the evidences that the present road was not the original means of approach to the castle, and gave other interesting details of the building. As to its history, he showed that it was founded by Sir Edward Dalyngruge, who became possessed of the manor through his wife, Elizabeth Wardedieuse, a descendant of the ancient family of De Bodiham. It descended through various families to the Cubitts, and now remained in the possession of Lord Ashcombe, the present head of that family. In 1643, after the Parliamentary forces had taken Arundel, Sir William Waller despatched a body of troops to Bodiham, to whom it was surrendered without a siege. The materials were taken away and sold, and the place was left with only the bare walls standing, very much in its present condition.

After luncheon, the journey was resumed in carriages to Hawkhurst Church, a large and handsome structure, consisting of a chancel with side chapels, and nave chiefly of the XIVth century, with widened aisles, north and south porches, and western tower of the XVth century. Mr. Hope pointed out the principal features of the building, including the evidence of a former central tower and the hitherto overlooked existence of a charnel, or bone-hole, under the eastern part of the chancel north aisle. He also called attention to the singular external chamber at the east end of the chancel, now used as a vestry, but which until 1859 had never had any direct communication with the church.

The drive was next continued to Etchingham Church. This was described by Mr. J. T. Micklethwaite, who pointed out that it was a small but beautiful structure, built all at one time towards the close of the XIVth century, and affording an interesting example of what the builders of the day could do when untrammelled by existing old work. He also called attention to the remains of the admirable original glazing in the windows, and to the old fittings in the chancel, and to the existence on a former visit by him of a wooden figure of Our Lady which had probably belonged to the rood. This has now mysteriously disappeared. The party then returned by train to Tunbridge Wells.

In the evening a meeting was held in the Pump Room, when Mr. W. H. St. John Hope read a paper on "English Domestic Architecture down to Tudor Times," illustrated by a large number of lantern slides of ground plans and views.

On Thursday, July 27, the members of the meeting went first by train to Sevenoaks and drove thence to Knole House, the splendid mansion of Lord Sackville. Begun by Archbishop Bourchier soon after 1456 on the site of an earlier building, it was enlarged by Archbishop Warham and later owners, and finally brought to its present form early in the XVIIth century. The house is so much more famous for the magnificent and unrivalled pictorial and other treasures which it contains that its architectural features are rather apt to be overlooked, and, as the rules under which it is inspected allow of the admission of only small numbers at a time, the party had to divide, so making detailed description difficult. Nearly two hours were profitably spent in viewing the numerous interesting works of art before the hour of luncheon arrived.

After luncheon carriages were again in readiness to convey the party to Wrotham, where the Church of St. George was inspected under the guidance of Mr. Hope. The building consists of a chancel of the XIVth century, a nave with north and south aisles and a south porch, mostly of the XIIIth and XIVth centuries, and a western tower. This last is also of the XIVth century, and, owing to its being built close up to the western limit of the churchyard, has a nice vaulted passage through the lowest story to enable processions to go round the outside of the church. There is another curious passage within the church in the thickness of the wall above the chancel arch, with two small lights from the nave and another from the chancel. It is reached by an upward continuation of the rood staircase, and was explained by Mr. Hope as a convenient mode of access to the roofs, which can all be reached from it. The XVth century rood-screen and a square Purbeck marble font are all that remain of the old furniture of the church, and every one of the windows has been "restored."

Leaving Wouldham, the drive was resumed to Yaldham Manor, where the party was hospitably entertained to tea by Major-General and Mrs. Goldsworthy. Mrs. Goldsworthy also read a short paper on the descent of the manor, which was for a long time in the hands of the Pekhams. The house was originally of the courtyard type, but has for the most part been pulled down, with the exception of an interesting hall, *circa* 1500, and some remains of the kitchen offices.

The journey back to Sevenoaks was made under most discomforting circumstances during a violent thunderstorm, and hardly one of the party escaped being soaked to the skin by the tremendous downpour of rain. Luckily an earlier train than that fixed upon enabled the party to reach Tunbridge Wells without further delay.

Friday, the 28th, was devoted to visits to Allington Castle, Aylesford, and Kits Coty House. Leaving by special train at 9.35, the party reached Maidstone at 10.20, and drove first to Allington Castle. Here Mr. and Mrs. Dudley Falke received the travellers, and the building was described by Mr. Hope. The manor of Allington, be pointed out, belonged at the time of Domesday Survey to Bishop Odo of Bayeux, but, on his disgrace, was granted to William of Warenne, who probably raised here a mount-and-bailey castle to control the passage and fords of the Medway and the road connecting Maidstone with Rochester. The castle was slighted in 21 Henry II., when 60s. were spent "in prosternendo Castelli de Alintone," an entry which Mr. Hope thought referred to the overthrowing of William de Warrenne's great mount on the south of the present castle. The place eventually descended to Sir Stephen de Pencestre, Constable of Dover Castle and Warden of the Cinque Ports, who obtained licence on May 25, 1281, for himself and Margaret his wife to crenellate their house of Allington, in the county of Kent. Of the work then built there still remain the enceinte wall of a square enclosure, with drum towers at intervals, the gatehouse and part of its covering barbican, with a range of lodgings adjacent, and some fragments of the great hall, with the doorways from the screens. The building subsequently passed into the possession of Sir Thomas Wyatt, the statesman and poet, who died in 1542. To him are probably due the porch of the hall and a number of inserted windows in various parts in lieu of the earlier and smaller openings. The buildings underwent further alterations towards the close of the XVIth century. One of the most noteworthy points about the XIIIth century buildings is the original brickwork forming the heads of many of the windows and doorways. These bricks are light in colour, and measure 9 in. by 4½ in. by 2 in., and in places have been purposely made to fit the joints. Before leaving the castle an inspection was made of the remains of the overthrown mount.

From Allington the journey was resumed to Aylesford, at the entry into which the fine XIVth century bridge was crossed. This interesting bridge has for some time been threatened with destruction, but repairs in progress lead us to hope that the danger is for the present averted. Before luncheon Aylesford Church was visited. This was described by Mr. Hope as consisting practically of two collateral naves and chancels. The southern nave, which was the older, was Norman in substance, with a massive tower of the same date, and originally an apsidal chancel, which had afterwards been replaced by a square-ended one. The northern half of the church is of the XIVth century, but the arcade has been subsequently rebuilt. The church contains an interesting series of late monuments, crowded away in the north chapel, and a section of old screenwork, now used as a reredos to a side altar. This screen contains several curious sliding panels, through which a view of the altar could be obtained.

After luncheon a visit was paid to the Friars. This is the site of a monastery of Carmelite or White Friars founded by Richard Lord Grey, of Codnor, in 1240. It is approached by a picturesque Elizabethan gatehouse, but little is left of the monastic buildings beyond two sides, each of five bays, of a two-storied cloister, *circa* 1450, the shell of the frater and kitchen on the south and of the western block. On the west of the claustral buildings is the outer court, enclosed by the stables and other offices of the Elizabethan grantee, John Sedley. These, however, occupy the sites of older structures. The principal features of interest were pointed out by Mr. Hope. The drive was next resumed to Kits Coty House, a megalithic structure of some note, consisting of three great upright stones sustaining a huge capstone, and probably once covered up by a mound of earth. The remains of another, but overthrown, megalithic structure hard by, called the Countless Stones, were also inspected. These, Kits Coty House, and two other series of stones at Coldrum and Addington respectively, on the other side of the Medway, form a remarkable isolated group of such structures in this part of England. After some instructive explanations by Sir Henry Howorth the journey was resumed to Maidstone, and thence by rail back to Tunbridge Wells.

At the evening meeting in the Pump Room Mr. Harold Sands read a paper on "The Various Types of Castles and their Development," illustrated by a large and interesting series of lantern slides.

(To be concluded in our next issue.)

THE ROYAL INSTITUTE OF PUBLIC HEALTH.

THE following is the conclusion of our report of the Congress of the Royal Institute of Public Health, which was recently held in London :—

THIRD DAY'S SITTING.

Professor Adams presided over the third sitting of Section D, when further papers were read with regard to the disposal of sewage.

The Tanking of Sewage.

Mr. F. Wallis Stoddart, who opened the proceedings with a paper on this subject, said the inspection and comparison of a large number of sewage works, all based more or less completely on biological principles, has brought into prominence the fact that there is an imperfectly understood difference in the final results obtained in different places under apparently identical conditions. This had not hitherto received adequate explanation, being usually attributed to some obscure difference between the sewage produced by various communities. Putting aside, however, the comparatively limited number of examples in which the predominance of trade wastes, or other local circumstances, causes the sewage to depart appreciably from the normal, there remains abundant instances of works quite similar in construction and dealing with sewage of purely domestic type, under apparently parallel conditions, where the effect, including in this term both demand for supervision and perfection of final effluent, is by no means uniformly satisfactory, the chief cause of complaint being the production of offensive odours. On carefully tabulating these instances it becomes quite unmistakably evident that the most variable factor is the length of time occupied by the treatment, and the degree of putridity attained by the sewage before arriving at the final stage of oxidation. It is further noticeable that the acuteness of the trouble is in direct proportion to the completeness of putrefaction, and that in cases where the detention of sewage is exceptionally prolonged there is a very abundant production of offensive gases, the effect of filtration is but slight, and the interior of the filter, of whatever type, when dismantled, is found to be occupied to a large extent by a black slime, which coats the particles of the medium with a tenacious and offensive layer, or even fills up the interstices altogether. A consideration of these and other facts led to a series of experiments, having for their object and determination the conditions of working which allow of the most complete destruction of original sewage solids, with a minimum formation of the offensive and otherwise objectionable secondary products. With regard to the construction of the tank the result of the experiments was that the author came to the conclusion that a fixed cover is a disadvantage—it renders the tank more difficult of access, increases the expense, and permits the formation of a thick scum on the surface of the liquid. He also disagreed with the submerged inlet into the tank. As to the rate of flow two series of experiments were undertaken, and, from the first, it was concluded that the most rapid uniform rate at which full-strength sewage could be passed through the tank with the most satisfactory results as regards both destruction of sewage solids and quantity of tank effluent, is insured by providing a tank capacity equal to one-third the day's supply of sewage, or 1 cubic ft. for 20 gals., and that the extreme limits between which satisfactory results can be obtained are 12 gals. and 35 gals. per cubic ft. respectively. The second series of experiments were that in which the maximum rate determined as satisfactory would be adopted as the maximum threefold flow; but in which the actual rate of flow would follow the natural variations, the tank capacity being so adjusted that the average dry-weather flow would be one-third this maximum. The effect of this experiment has been exactly what was desired, and the tank effluent has always been inoffensive and sufficiently free from suspended solids.

Design and Management of Sewage Disposal Works.

Mr. A. P. I. Cotterell, M.Inst.C.E., F.S.I., then read a paper entitled, "The Developments in the Design and Management of Works of Sewage Disposal." Speaking generally, he said the commonly accepted practice of to-day might be said to consist of two processes :—First, reduction of the solids by sedimentation, precipitation, or bacterial liquefaction, or by all these combined; followed, secondly, by oxidation of the resultant liquid by means of bacterial agency. There were many varieties of these processes, and, in some cases, the two might be said to intermingle. . . . It seemed strange at first sight that there should be at the present time so many apparently different modes of dealing with a common problem. It was clear, however, that they are all concentrated methods of doing what, in ancient days, the land was expected to undertake, and that they have all been rendered necessary by the concentration of the population in such numbers in particular spots, that land, with its broad and easy-going ways, was no longer capable of doing the work efficiently. Land treatment was still the ideal method of sewage disposal, but it is becoming less and less practicable. There were numerous factors governing the problem which lead to the adoption of one method in preference to another, such as the character of the sewage; its quantity, the quantity and quality of the storm water; topographical considerations; levels and floods; the neighbourhood of tidal waters; the proximity of the population; matters of sentiment, and, last, but not least, the question of cost. With so many factors to be taken into consideration, there was plenty of room for variety in design; but it was striking to notice in the rules laid down how comparatively little attention is paid to the quality of the sewage, and how much more importance was given to the quantity to be treated. Whilst quantity was certainly a most important factor, the quality of the sewage surely required greater attention than had hitherto been bestowed upon it. In his opinion, any rules should be based upon this factor, as well as upon that of quantity, or they should be made sufficiently elastic to allow of the adaptation of each individual installation to its special needs. It was inadvisable to attempt conformity with a fixed rule, supposed to be applicable to all sewage-disposal works alike, no matter what their particular circumstances might be.

Dealing with specific portions of the problem, the author considered the liquefying or preliminary tank process. "If we examine the internal working of an ordinary septic tank constructed to hold one day's dry-weather flow, in accordance with the prevailing rule, it will be found that the deposition of solids takes places in practically the first third of the length nearest to the inlet. In the middle third scarcely any solids collect, whilst in the third nearest to the outlet solids are again thrown down, though in smaller quantity than in the first division. It would appear as if the liquid is fit for filtration after having traversed one-third only of the length of tank usually assigned to it. This would mean that a sedimentation tank only might suffice to bring the liquid into proper condition. Doubtless septic action would thus be minimised, but so long as the sewage is made ready for oxidation, what does that matter? A reduction in the size of the septic tank would be welcome, if only on the score of reduced cost; but it would also mean that the special cultivation of anaerobic organisms is less important than we have been accustomed to consider it, and might be more or less abandoned. Probably none of us would be sorry to do without the smell that too often accompanies anaerobic treatment. If the above view is correct, it is easy to see that the days of precipitation by chemical agency are not yet by any means played out. The way in which chemical precipation still holds its own in England is a proof of this. Indeed, in many instances it may be said to be the only feasible method, where it is imperative to reduce the sewage to oxidisable conditions in the smallest possible time, or where the adoption of septic methods would make the works altogether too unwieldy. Of course, we cannot touch chemical precipitation or even sedimentation without also having to face the sludge question. In spite of all efforts to abolish it, the sludge question is still with us, and is likely to be. Only in broad irrigation, and not always even there, can it be said to be eliminated. . . . It is in the oxidising process that the greatest developments have taken place, and are still likely to come. Can oxidation be more efficiently carried out, and, if so, by what means? Developments already made show that by careful selection of the materials a larger quantity of sewage can be purified in a given cubic space. Have we yet got the best materials for the purpose? Large pebbles have been tried, with success so long as the flow was small; clinkers, coal, limestone, layers of slate, and many other media. On the whole, the most successful material has been clinker, because of the large surface it affords for the growth of bacteria. But clinker has also the disadvantage of breaking up too readily. A short time ago an inventor advertised a filter composed of small balls of some indestructible material about 2 in. diameter, claiming by this to obtain a very large surface for bacteria action. Is it possible to hit upon some material artificially made up that shall give the maximum surface within a given cubic space? . . .

The largest possible number of oxidising bacteria should be cultivated by maintaining the maximum surface, and by providing the maximum amount of food that they are capable of dealing with.

The supply of air should be ample, and should circulate in every portion of the filter. So far mechanical systems of introducing air have not been very successful.

The bacteria should be kept regularly at work. Nothing appears to be gained by allowing them periods of rest.

On the other hand, the bacteria must not be overdosed or put under conditions where, even for a time, their energies are paralysed.

Every portion of the oxidising or filtering medium should be put to its fullest possible use.

In the application of the liquid any kind of moving mechanism is undesirable, for the reason that all machinery, however simple, is liable to get out of order unless constantly kept under view. In large works, with men on the spot both night and day, the objection does not hold good so much as in small installations, where the cost of annual upkeep bulks largely, and where there is a tendency therefore to reduce all expenses of labour to a minimum.

There should be plenty of elasticity, so as to accommodate considerable variations of flow. In this connexion sewage works should be capable of treating a larger storm flow than they do at present. Ideally, all storm water that comes down through the sewers should be treated to the extent necessary to render it at least equal in purification to the best effluent the works are capable of turning out.

Some arrangement for thoroughly distributing the liquid and keeping it distributed throughout the oxidising medium, whilst at the same time affording the organisms an ample supply of air, would seem to promise best. In the writer's opinion it is in this direction that progress should be encouraged. Then, instead of reducing the present allowable flow of 168 gals. per cubic yd., the Local Government Board will be able largely to increase it, especially when it becomes very dilute, and will thus enable us to reduce the cost of one of the chief items in sewage-disposal works, whilst at the same time improving the efficiency.

As a result of the first interim report of the Royal Commission, the rule laid down by the Local Government Board has been so far modified that final land irrigation may be abandoned so long as the filter is doubled in size. Apparently this may be effected by double contact in the case of contact beds, or double filtration when continuous filters are employed. Surely, however, this is a step in the wrong direction. Instead of reducing the cost of sewage disposal it simply increases it by making the conditions more onerous than before, without necessarily ensuring corresponding efficiency. . . .

In one other respect great development has taken place in sewage-disposal works. Formerly any intelligent labourer was considered to be capable of looking after the business. . . . It is a great advance to have it recognised that the management of sewage disposal must be the work of trained specialists. We may, indeed, welcome the advent of the Association of Sewage Works

Managers, which crystallises this development.

In this connexion it is well to bear in mind that sewage disposal has now been established in a number of small towns and villages, where it is too expensive to provide fully qualified caretakers. A useful development for all such cases would be the grouping of a number of sewage works under a qualified inspector (appointed, say, by the County Council), whose business it should be to pay surprise visits, and to assist and instruct the various managers within his particular area."

Summing up, the author said it might be submitted :—

1. That future development is likely to proceed on the line already adopted.
2. That on account of the many factors governing the problem, no one system is likely to supersede all others.
3. That in the design of sewerage works quite as much attention should be paid to the quality and character of the sewage as to its quantity.
4. That the cost of the preliminary process may probably be reduced—at any rate, so far as septic methods are concerned.
5. That there is no chance of eliminating the sludge question, although there are indications that it may be more and more brought under control.
6. That the oxidising process is capable of further development.
7. That future sewage-disposal works must be much more elastic.
8. That such works must be capable of dealing with most, if not all, the storm water that enters the sewers.
9. That it is essential that the management of sewage-disposal works should be in the hands of thoroughly qualified men.

Richmond Sewage Purification Works.

Mr. W. Fairley submitted a paper on "The Sewage Purification Works of the Richmond Main Drainage Sewerage Board," which, in the author's absence, was read by Mr. A. P. Martin. The works are situated at Mortlake, on 11 acres of land adjacent to the Thames. The whole area is enclosed, but about 3 acres are yet available for future extension. The works comprise pumping-station, chemical precipitation appliances and tanks, sludge-pressing plant, filtration areas, bacterial tanks and filters, dock, cottages, stables, etc. The pumping machinery is unusually extensive for the population, amounting to a total capacity of about 36,000,000 gals. in twenty-four hours, in units ranging from 4,000,000 gals. to 14,000,000 gals. In the chemical process the sewage is treated with milk of lime and sulphate of alumina, with the addition at certain times of proto-sulphate of iron or permanganate of potash. The precipitation tanks have a capacity of 1,200,000 gals., and are eleven in number; the dry-weather flow is about 3,000,000 gals. per day; at times of rainfall the flow is increased to 6,000,000 gals., and during heavy rain-storms to 15,000,000 gals. per day, while during short periods the flow often is at the rate of 30,000,000 gals. per day. The tanks can be worked on either the intermittent or continuous system as may be convenient at the time. On being discharged from the tanks the effluent can be delivered into the river by an outfall pipe, or further purified in continuous filtration areas. The sludge from the precipitation process is dealt with by filter presses, and from 6,000 tons to 7,000 tons of pressed cake are produced during a year. The works have now been in operation since 1891, and up to the present have satisfactorily fulfilled all requirements by chemical treatment without complaint of any kind either from the Thames Conservancy or the residents. The recent addition on bacterial lines is meant to decide whether extensions, which are proposed in the near future, will be on the old or more recent process. Experiments made during the past two years show that the effluent from a chemical precipitation process treated in contact filters gives uniform and good results, with considerable economy in the amount of chemicals used.

Dr. Kinnicutt (U.S.A.), in opening the general discussion, agreed with Mr. Stoddart as to the rate of flow of sewage. In America they heard of "over septic sewage," which Mr. Stoddart had explained. The sewage was often kept so long in the tank that they got a secondary decomposition, which, he thought, should be avoided. The rate of flow entirely depended on the character of the sewage. He could not quite understand why Mr. Stoddart did not believe in the submerged inlet, for he did not see why there should be more disturbance if the inlet was 6 in. below the surface than if it was 6 in. above, and he had found no difficulty with regard to this. In Worcester (U.S.A.) they had a very strong manufacturing sewage containing much free acid, and they were considering whether they should not treat this by chemicals, and afterwards treat the effluent on intermittent filtration beds rather than use septic tanks. That was not because they did not agree with septic tank treatment for ordinary sewage, but with a strong manufacturing sewage chemical precipitation might be the best.

Mr. McDonald (Glasgow) said it used to be said that bacteria treatment annihilated all sludge, but they did not appear to have got rid of it. In Glasgow they tried, experimentally, the bacteria plan, and if they had liked to spend enough money they could have got the sewage to a purity in excess of drinking water. No one, however, would suggest that they should treat sewage on those lines, and if they in Glasgow could produce a degree of purification which the chemist placed as high as 68·8 per cent., and at a cost which compared favourably with the cost of other local authorities, then they were not warranted in applying the more costly method of bacteria treatment after sedimentation.

Mr. Whyatt (Grimsby) took exception to the statement by Mr. Cotterell that there should be a grouping of local authorities, and that the County Council inspector should pay surprise visits and give instructions to the manager. As a matter of fact, the County Council inspectors did pay surprise visits to the works by local authorities, and if they found anything wrong they reported to the County Council. He thought that if the inspector attempted to instruct the managers they would refuse to accept such instructions, and the committee of the local authority, who were responsible, and had to solve the problem, would also object.

Mr. Stewart (Bridgnorth) said that he did not agree with what had been said against bacteria, for they had no sludge to deal with. They had a small grit chamber, which was emptied once in six weeks, but which practically contained nothing but sand. The bacteria treatment, first in the tanks and then on the beds, had been satisfactory to them. He felt, however, that there was a great deal to be learned in respect of how long the liquid should remain in the septic tank. For a perfect sewage he thought they wanted a secondary bed as well as a primary bed.

Mr. A. J. Martin remarked that Mr. Stoddart had given practical information on a subject on which there had been a great deal of theorising, but little practical work. In the Leeds Report the conclusion arrived at was that twelve hours did not give satisfaction, but twenty-four hours did, and thirty-six hours was no better. He thoroughly agreed with Mr. Cotterell that the nature of the sewage, as well as the quantity, ought to be taken into account. Mr. Whyatt said that that was always done. They who were engineers did endeavour to do so, but, unfortunately, the matter did not rest solely with the engineer. The works had to conform with certain requirements of the Local Government Board, and their rules did not take that into consideration. With regard to the annihilation of sludge, he would like to make it clear that the responsible advocates of the bacteria treatment did not make that contention.

The Chairman said that, with regard to the annihilation of sludge, twenty-five years ago he put a cesspool in his grounds which was not ventilated, and at the end of seven years, when it was opened, there was nothing there. He let the house on a seven-years' lease, and when, at the end of that period, the cesspool was again opened, there was nothing there. That was a case in which the sludge entirely disappeared.

Replying to questions, the Chairman said of course this was purely domestic sewage treated in the cesspool.

Mr. Stoddart said undoubtedly such sewage as Dr. Kinnicutt had spoken of would have to be separately considered, but he felt that domestic sewage was of one character, although it differed in strength and in the degree of putridity in which it reached the works. He thought that too much was made of the individual treatment of individual localities.

Mr. Cotterell said that what he pleaded for was a greater elasticity in regard to the rules laid down for the treatment of localities, and the way to get at that was to take into account the character of the sewage to be treated. With respect to the point raised by Mr. Whyatt, he meant that in a small place they could not afford skilled management, and if they grouped localities together there would be better management at a smaller cost. At present an inspector came down and went away with his thoughts, and the cumbersome process of reporting took place. He thought the aim should be to make sewage disposal as cheap as possible, and those engaged in this subject ought not to stand too much on their dignity.

Sewer Ventilation.

Dr. J. T. Neech (Halifax) opened a discussion on "Sewer Ventilation," and said it was a question which had engaged the attention of engineers for years past, and the ideas held were very diverse. He intended to touch on only one aspect of the subject, that to which he considered sufficient consideration had not been given. It was the emanation of foul-smelling air from sewers which was the chief cause of the necessity for ventilating sewers, and it was not in the main sewers that the largest volume of foul air was present. Sewer air was present in a much greater quantity in the branch sewers. The smaller drains, he thought, were generally made larger than were necessary, and he was of opinion that the ordinary house did not need a drain pipe of the diameter of 6 in. The amount of sewage in an ordinary house did not exceed 100 gals., and a 4-in. drain would dispatch that in about forty seconds. If, therefore, house drains were made smaller, there would be less sewer air to deal with. With regard to the cause of the foul air, an unevenly-laid sewer would, of course, cause it, but sewers, however well laid, were at times filled with it. Dr. Neech proceeded to take Halifax in illustration of his argument, and said that, taking the street gullies and the gullies or traps from the houses, it gave a total capacity of the open gullies of 92,000 gals., and that means that the sewage had to pass through a septic tank of a 92,000-gals. capacity. Would they not be surprised if the air of the sewers was not foul? He advocated that, so far as possible, the size and the number of the existing gullies should be reduced, and exhibited a diagram of a trap which contained a smaller quantity of water than that ordinarily used, and which was self-cleansing.

Dr. Weaver (Southport) said that, after dealing for ten years with the problem in Southport, they had solved it by the adoption of Webb's patent lamps. Their policy in future was to close their surface grids and trust to the lamps. They had reduced their typhoid cases from thirty a year to two this year.

Mr. Whyatt strongly recommended the closing of surface openings in every position. In Grimsby they put up tall ventilating shafts.

Dr. Neech, in reply, said that he had dealt with the subject on the lines of prevention. He agreed with closing all surface openings. With regard to Dr. Weaver's observations, he thought they had better give the system five years' trial before basing definite views on it. He agreed that tall shafts were valuable, but sometimes the air descended and mixed with the air people breathed.

Destruction of Town Refuse and its Utilisation.

Mr. P. Atkinson (Hull) had prepared a paper on this subject, which was read by Mr. Alderman Cohen. The author laid down the following as the necessary conditions for a perfect destructor:—(1) To destroy rapidly all town refuse without committing any offence or possible nuisance; (2) to fuse and reduce the refuse dealt with to the least possible amount of clinker; (3) to deal with the refuse residue and by-products with the greatest economy and efficiency.

In the new destructor erected in 1901 in Hull these conditions are complied with and successfully carried out. It has now been in operation, working night and day, since February, 1902.

Hull has two destructors. In 1897 a Horsfell destructor was erected. During the time that this destructor has been at work, no complaint has been made by the inhabitants of the district in which it is situated of any nuisance arising from it. The work at the present time is carried out by four men, who work one shift of ten hours and are paid at the rate of 6½d. per hour. The number of loads dealt with during 1904 was 10,244, equal to about 10,000 tons, and the working cost was 611*l.* 10s. 7d., or equal to 14·75d. per ton. A second destructor by the same company was put into operation in February, 1902, the total cost being 24,593*l.*, including 4,119*l.* paid for the site. The number of loads dealt with at this destructor during 1904 was 24,032, equal to about 15,436 tons, and the working cost was 2,137*l.*, or equal to 32·82d. per ton. At present the only use the Hull Corporation are making of the steam generated at this destructor (besides the forced draught) is in connexion with the cart-hoist in use at the destructor, the lighting of the destructor by electricity, and the supplying of steam to the Corporation disinfecting station, which is only a few yards away. Such destructors, however, are capable of being utilised for other purposes, and they hoped in the near future to make greater use of them.

Mr. Whyatt said that at Grimsby they disposed of their slag at 1s. 6d. per load, and in these circumstances there was no need to put down plant for flag making.

Mr. Melville (Leeds) remarked that in Bradford they made mortar, and architects there specified for composition mortar, as they would get a good thing.

Mr. Cohen said that at present they were not utilising the Hull destructors for manufacturing purposes.

FOURTH DAY'S SITTING.

Professor Adams presided on Tuesday over the fourth and final sittings of Section D, when papers dealing with ventilation and heating, smoke abatement, and fog were discussed.

Ventilation and Heating.

A paper on "Ventilating and Heating" was read by Mr. E. G. Rivers, M.Inst.C.E. He said that the supply of air per person per minute was placed by some authorities at 30 cubic ft., while others assert that as much as 50 cubic ft. is required. Personally, he inclined to the opinion that a computation based upon the 30 ft. or minimum scale would suffice very well, if the air was of good quality. Given an enclosed space occupied by a number of persons, the computation as to the change of air, viewed either way—*i.e.*, at per person, or the change of the cube of the room so many times in the hour became one of simple arithmetic. As to the means by which this change was to be achieved, he had often wondered at the credulity of users of certain appliances for the alleged securing of the required change of air in a building on the principle of so-called "natural ventilation." Without much thought, such appliances were piled into building contracts and were expected to do great things in the change direction, and in a good many cases no provision was made for the admission of air to replace that alleged to be removed. Given a certain wind velocity and means of admitting fresh air, there would probably be an upcast to a certain extent in such appliances, but something totally ineffective for dealing with the change incidental to a considerable occupation. Under winter conditions, with still outer air, there was no upcast, but, on the contrary, a descent of the colder and heavier air into the building.

The concentration of persons in an enclosed space demanded, therefore, a concentrated supply of air, large in volume but low in velocity, and this could not possibly be effected save by mechanical means. In the ventilation of buildings very satisfactory results could be obtained by using fans of suitable type, properly applied, either dealing with the input or the extraction—preferably a combination of both.

As to cleansing and humidifying the incoming air, by cleansing he meant the removal of free carbon and other mechanical impurities chiefly; but in removing these effectually it was fair to assume that at the same time we reduced the presence of the many terrible species of bacteria which medical investigators allege to have discovered, to a harmless minimum. The presence of such bacteria in a place to which a washed fresh air-supply had been given was quite within the bounds of possibility; but if bacteria could not be located in the air-supply, we must look to other sources of origin, when their exclusion altogether might be found to be absolutely impossible. In all properly-designed systems there must be a main air-intake for winter work, and the best position for this was near the ground-level—just sufficiently protected from the entry of heavy impurities by a low wall. From this point the incoming air should be taken into the screen chamber, steam coils being placed between the point of air entry and the screen to guard against the freezing of the washing water in winter-time. The input fan should be placed some distance away from the screen, through which the emulsion of air and water was first drawn, and then propelled into the main airways for heating and distribution. As to the washing-screen, it appeared to him that the points in connexion with a washing-screen might be classified as follows:—

1. That the materials of construction should not be decayable.
2. That the impurities removed from the air should not be retained upon the screen.
3. That the interstices should not allow of the passing of untreated air.
4. That the consumption of water should not be excessive.

The author then described the type of washing-screen which he recommended to the committee appointed to consider the ventilation of the House of Commons, and which had been adopted. Proceeding, he said the next point which called for attention was the warming and distribution of the incoming air. The alleged advantage of the initial heating-battery system did not appeal to him, for the following reasons:—

"It is necessary under this system to have either a battery with a very high temperature upon the elements, which are often inaccessible for proper cleaning or repairs, or else one of very large superficial area. If the former is adopted, the air is likely to be devitalised from overheating, but in this sense the latter is not so objectionable, though a serious loss of thermal units occurs in both cases in the main and distributing flues. (In all systems of flue-distribution, whether of hot or cold air, it is necessary that the flues be constructed of glazed brick, and with ready access for cleaning.) Continuing my observations upon the initial heating-battery system, either of absolute plenum, or combined plenum and exhaust, the question of the velocity of the air passing over the battery is one of vital importance. This is a rock upon which many people come to grief, and the height of absurdity seems to be reached when we hear of such things as 'high velocity plenum.' In such a system the high temperature of the steam units in the battery is speedily lowered on the side of the elements facing the incoming air, and the whole approaches the condition of an air condenser. The passing air is not allowed sufficient time of contact to pick up the thermal units, and the arrangement is therefore inefficient and wasteful. The question of velocities is one to which engineers should devote more attention, and they should keep in mind the intimate relations of cause and effect as applied to these principles. It will be found that the effective collecting of thermal units from a heating surface demands a low velocity comprised within a very limited range, and I venture to think that this reason alone goes a good way towards the condemnation of the initial heating-battery system. As the result of many years' experience and study of the subject, I incline to the opinion that the most economical and efficient arrangement should include the following points: With the air intake and washing-screen arranged as before described, the input fan would send fresh air into horizontal airways of sufficient size—say, in the basement of a building—and from these controllable distributing-flues would be taken up in the main walls to radiator positions in the rooms to be warmed. In this arrangement the main airways receive the maximum velocity of the fan discharge—this being subsequently lowered in the distributing-flues. The ventilating radiators would take their inlet-air from these flues, imparting the thermal units at a low velocity. To counteract the chill arising from glass surfaces exposed to the outer air, radiator positions should preferably occur under windows, and under this arrangement warmed fresh air would enter at a low level.

"We now have to consider the direction of the supply, in order to insure an efficient change of air in a room. Taking open-air conditions as a guide, it will be found that air-currents take a horizontal direction, coupled with a tendency to rise slightly from contact with the warm earth in the summer season—of course, at low velocities. When velocities are high, the tendency to rise practically disappears. Fresh air being admitted low down on one side of a room, the direction of the flow should be across the room, and the extraction apertures should be at two levels—one at the same height as the point of entry, and one at the ceiling-line—both communicating with the same extraction-flue.

"The system of fresh air admission at the floor-line in the debating chamber of the House of Commons has been much criticised. It is, perhaps, not an ideal arrangement, and had the chamber been constructed to allow of floor-gratings of large area at each end—these gratings being reserved for inlet and extraction respectively—the passage of air across the chamber would, perhaps, have been better than the present system; of course, the gratings would have been railed off from the walkable floor of the House. However, the present conditions cannot be altered, and, as matters are, the small extent of possible vitiation attendant upon walking over the air-inlet gratings is reduced to a veritable minimum by the dilution incidental to the abnormal number of changes of air per hour.

"Extraction of vitiated air requires as much attention as the inlet supply, seeing that without removal no circulation can occur—the truism as to the impossibility of filling an enclosed space beyond its capacity should be borne in mind. With an input fan exercising water-gauge, it might be contended that the warmed, and therefore lighter, air would readily travel through vertical extracting-flues to an egress-point without further assistance; and under summer conditions this might be so, to a certain extent. When, however, we have to face the winter problem, with density and weight in the outer air, we must either increase the plenum input to an objectionable velocity which would affect the heating, or preferably we must supplement the fan input by similar extraction.

"The direction of extraction by water-gauge fan may be either upward or downward—if the latter, a slight increase of power becomes necessary. Undoubtedly the best results have been obtained by a judicious combination of plenum and exhaust. The point sometimes urged against such a system is the cost of installing and working it. To this I would observe that in other countries, notably in the United States, a large percentage of the cost of an important building is devoted to warming and ventilating it—surely the matter should be considered equally important here?

"Hitherto I have dealt with the horizontal system of air-change, which I consider to be the best suited to the majority of cases, when such a system can be applied; but for theatres and other similar places of public assembly, there is no valid objection to the downward plenum system, coupled with ultimate upward extraction *viâ* flues in the main walls. In this case the ultimate outlet for the vitiated air must be carried well above and away from the inlet, unless the latter is first taken from below. The ancient idea that extraction must necessarily be upward, because heated air rises, must be dismissed from our minds. What we have to keep in view in the case of a theatre is the periodic change of the air without draught to the audience and irrespective of direction. The air admission in the downward plenum system should be over as large an area as possible and at a low velocity; therefore in the contruction of a new building this can be best effected by the interposition of a separate roof-space as an equalising chamber. The inconvenience and danger of 'streak' ventilation by the injudicious use of

fans is a matter which should be kept in view. . . ."

Mr. Whyatt said that the author of the paper had referred to there being no waste of the water which passed through the washing screen as it was used in the boiler. He would like to know whether that did not result in the accumulation of a large quantity of mud in the boiler.

Mr. McDonald said that the architect should arm himself with the advice of the specialist in heating, but he should also not fail to exercise his own judgment with regard to the methods submitted for his consideration. He knew a case in Glasgow where the architect surrendered himself to the advice of the expert, with the calamitous result that, whereas there was an ingenious arrangement for the introduction of air into the building, there was no provision for the extraction of foul air. There was no doubt that mechanical abstraction was an absolute necessity in large buildings. All automatic systems were at a disadvantage when there was a fall of temperature.

Dr. Weaver felt that while, theoretically, heating seemed the right thing, yet many people were apt to overdo it.

Mr. A. J. Martin said he was struck with the wonderful ingenuity of the washing system adopted at the Houses of Parliament. Further, he was impressed with the plan that the engineer should be called in for the ventilation of the building while that building was yet in a plastic state. It too frequently happened that the architect carried his work to his utmost limit and then handed it over to the unfortunate engineer, who found himself bound hand and foot by the work already carried out.

Mr. E. G. Rivers, in reply, said that the impurities in the water were captured by the purifier before it reached the boiler. With regard to the collaboration between architect and engineer, he was afraid sometimes the architect had a very feeble reed to rely upon in the engineer. At the present time he was working with Mr. Burnet in connexion with the extension of the British Museum, and they were acting together quite harmoniously.

Smoke Abatement.

Mr. Henry Adams, M.Inst.C.E., then read a paper on "Smoke Abatement," in the course of which he said that by lessening the production of smoke we should be conferring a benefit upon London as a whole. Those who had visited Paris would probably have been struck with the cleanliness of the streets and the buildings in general, and upon inquiry they would have found that this arose from the widespread use of charcoal as a fuel, which makes a bright red fire without giving off visible smoke, or, in other words, it emits no unconsumed carbon. Having dealt with the enormous consumption of coal, and the action of the fuel in burning, the author said: "Next to the direct heat of the sun, that from an open coal fire has the greatest social charm and hygienic value, although it is the most extravagant way to use the coal. Such a fire not only warms the room, but assists in its ventilation by drawing some of the surrounding air up the chimney, as a current is always established in the direction of the fire, part going to provide oxygen for the combustion, and the remainder going direct to the open chimney. In watching an open fire, particularly when fresh coals are added, it will be seen that a sort of distillation occurs, and a quantity of smoke is discharged from it until the heat has sufficiently penetrated the fresh fuel, when it bursts into flame. Now, it is evident that, if the fresh fuel could be introduced below the fire instead of above, the major part of the smoke would be prevented; but there are serious mechanical difficulties to be overcome, and although attempts have been made in this direction, I am not aware of one that has stood the test of practical use. My father, the late J. H. Adams, Past President of the Society of Engineers, always had the fires in his house lighted from the top—that is, the grate was filled with coal, and paper and wood placed above, and then a small quantity of coal on top to burn first and ignite the gases of the fuel below which were given off as the heat penetrated downwards. This was effective, and based on sound reasoning, as, although heat in general travels downwards slowly, in this case the vigorous combustion on the surface from the more complete burning of the gaseous matter amply compensated for the slower travel, and, in fact, proved very economical, but he could not maintain the principle without having a fire relaid. Generally speaking, the amount of smoke generated varies with the size of a fire, and the size of a fire naturally varies with the amount of heat required from it, so that any economy in utilising the heat indirectly results in the production of less smoke. For this reason the various arrangements known as warm-air stoves are intimately related to the question of smoke abatement." Mr. Adams then described several kinds of stoves and grates, and, in the course of his observations, he said that there are many causes for smoky chimneys; among them the following might be named:—Want of sweeping, chimney-pot displaced or broken, doors and windows fitting too closely, throat of chimney too large or lintel too high, chimney-stack too low above roof, higher roof adjoining, house situated behind a hill, a cold damp chimney, a second fireplace in the same room with stronger draught. Some writers made a distinction between down-draught and down-blow; there was no real difference, but the former might be attributed to causes acting at the lower end of the chimney, and the latter to causes acting at the upper end. It would be generally observed that the complaint was greater with the wind in a given direction for each particular flue, and this might often lead to a discovery of the cause. In conclusion, the author said:—"The head and front of the offence proceeds from the various factories and central stations. In spite of all the improvements in steam engines and boilers, and the vigilance of the inspectors of nuisances, countless tons of smoke are poured forth into the air every day. Innumerable arrangements have been devised, with more or less success, for the prevention of smoke, but the best smoke-consumer, after all, is a good stoker. 'Little and often' is the motto to bear in mind. Time will not permit me to go through a list of the various devices, from Jucke's onwards. I will only say that a hopper feed and mechanical stoking are the chief features of the successful apparatus as now used. With hand-firing, Welsh coal is practically a *sine quâ non*, but with mechanical-firing almost any small coal may be used. A closed ashpit and gentle forced draught, equal to about ½-in. head of water, add to the general efficiency. One of the most recent contrivances for consuming the smoke from furnaces is the Willskemp, consisting of a fire-brick arrangement behind the bridge, through which gas is burnt on the Bunsen method, raising it to a very high temperature, and carrying through at the same temperature a sufficient quantity of air to consume all visible smoke. Even when firing freely by hand no smoke appears at the chimney-top. I have not referred to the idea of smoke sewers, as I do not consider them sufficiently practical, nor to the deleterious effect of smoke when combined with fog, from which we suffer so much in London; these and many other points are open to you to discuss, and I will not occupy your time any longer before asking you to express your own views upon the subject of smoke abatement."

Smoke and Fog.

Mr. H. A. Des Vœux, Hon. Treasurer of the Coal Smoke Abatement Society, said that when they examined the results of fog they were brought face to face with an appalling state of affairs. What they had to deal with was the smoke in the atmosphere, and this was not so simple a question, because there was always a certain amount of fog or moisture mingling with the smoke. Statistics of fog were greatly required, because those which exist have not been made over a sufficiently long period of time to be of value. The main cause of fog was the lowering of temperature, together with an increase of moisture suspended in the atmosphere. There was really no reason why London should suffer any more from fog than the rest of the Thames valley; but, unfortunately, they added smoke to the fog, and got that horrible compound known as "London Particular." Fog pure and simple was unpreventible, but the predominant partner in the mixture was smoke. If improvement was to come, it must come from the lessening of the smoke, and particularly of the early morning smoke. Fifteen million tons of coal was consumed in London every year, and about half of this was probably consumed in factories. This smoke from factories, a Royal Commission had reported, could be entirely consumed. The speaker proceeded to deal with the efforts made by his society to remove the evil, and paid a high tribute to the activity of the London County Council. Tests had been made with regard to kitchen and sitting-room chimneys, and it was found that the grate which consumed the smallest amount of coal for the heat produced gave the least amount of smoke. With regard to the kitchen fires, he thought there was hope in the growing use of gas-cookers, and thought the time had nearly arrived when the Legislature might demand that all cooking should be done smokelessly. Gas cookers would remove 600,000 smoking chimneys from their midst, and he appealed to those present to make converts in the cause of a clean atmosphere. In conclusion, he moved: "That this Congress, being impressed with the importance of the atmosphere being free from smoke, urges on the Government the advisability of further efforts being made to attain that object."

Prevention of Smoky Fogs.

The Hon. Rollo Russell, in a paper on this subject, described the conditions which give rise to London fogs, and said the point on which he laid most stress was that the character and persistence of London fogs is not due to an excess of particles, but to an excess of particles of a certain kind. It is the radiative and tarry particles from bituminous coal which are by far the most effective in the production of dense persistent fogs. He had not the least doubt that, if London burnt wood or anthracite or gas, we should obtain an air as transparent in clear weather as that of Paris or Rome. Dark fogs, then, artificially prolonged, are due to the uneconomic burning of bituminous coal, and we have ample proof that, not factories, but kitchen and ordinary fires, are the main cause of London fogs.

Among the remedies, the most hopeful are the larger employment of central heating—improved ranges, furnaces, kitcheners, and fire-grates; cooking by ordinary gas or by heating gas, inspection of all coal-burning places which give off much smoke, improved stoking and economy, the taxation of smoky chimneys, like those of the Pall Mall clubs, and of bakehouses; the taxation or prohibition of bituminous coal in London, except for use in appropriate grates; the more frequent use of anthracite or coke and gas fires, and the extension of distributive kitchens. Possibly the best of all remedies is the removal of the people of London to the country.

The Air Supply of London.

Dr. Thomas Glover Lyon dealt with the subject of "The Air Supply of London," and remarked that a large portion of London was unfit for the bringing up of children. Up to the middle of last century all the population of London could easily get into pure air, but zones of houses have since been built, shutting out pure air from the adjacent zones. For every house built or rebuilt, means should be afforded for providing accessible tracts of land where pure air would be available. Strips of land, one mile wide at parts, should alternate with tracts of buildings, not more than two miles in width, for small scattered spaces are inadequate to furnish pure air. They would all agree that the ventilation of buildings and rooms is inadequate, and he suggested that the Local Government Board is inadequate in powers and methods to deal with that question. Large buildings should be split up into proper ventilating units. At present the lower parts foul the air of the upper parts, and the windward side fouls the leeward. He looked upon through ventilation as the only efficient method of ventilation. Theatres, schools, churches, and public assembly-rooms are inadequately ventilated, but theatres are waking up. In conclusion, the author made the following suggestions:—(1) That regulations should be drawn up for the adequate provision of open spaces in the building and rebuilding of large cities; (2) when public loans are raised to effect permanent improvements the interest should be paid by leaseholders, and the sinking fund ultimately by freeholders; there should be fines based upon

increase in values analogous to death dues upon granting and renewal of leases. By this method the open spaces of London would then be provided for out of the unearned increment; (3) that in the case of schools and public assembly-rooms of all kinds, provision should be made to admit a standard quantity of fresh air to each person the schools or assembly-rooms are intended to accommodate; (4) a department of public health should be formed with a Minister sitting in the Cabinet.

Mr. Rivers remarked that Sir Oliver Lodge had advocated the electrical dispersion of fog, but he (the speaker) thought it was better to grapple with the thing in its initial stage.

Mr. D. Archibald believed the London fog was, in a great measure, due to the smoke from kitchen chimneys. It was the richer people who burned the bituminous coal, and they ought to be called to book. There was a great deal to be done in the way of the building of flats to get the through ventilation, as suggested by Dr. Lyon, and also get rid of the offensive kitchen smells.

Capt. Carpenter considered that the factories were the worst sinners with regard to smoke, and thought that the improved grates in new houses was helping to remove the evil.

Mr. F. J. Brodie moved, and Mr. Baxter seconded, a vote of thanks to the readers of the papers, and this was carried.

The resolution proposed by Mr. Des Vœux was also agreed to, and the sittings of the section concluded.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of this Council took place on Tuesday in the County Hall, Spring-gardens, S.W., Mr. E. A. Cornwall, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend Battersea Borough Council 1,934*l.* for street-lighting purposes; Camberwell Borough Council 3,500*l.* for works at depôt, and 6,667*l.* for works at housing estate and depôt, and street improvements; Finsbury Borough Council 1,000*l.* for contribution to street improvements; Hackney Borough Council 21,708*l.* for electric-lighting and street-lighting extensions, etc.; Hampstead Borough Council 5,100*l.* for electricity meters, and 5,000*l.* for housing purposes; Islington Borough Council 27,275*l.* for paving works and sites for public libraries; Lewisham Borough Council 12,452*l.* for sewers; Paddington Borough Council 8,697*l.* for street widening; Paddington Guardians 11,326*l.* for poor law purposes; Shoreditch Borough Council 17,334*l.* for reconstruction and extension of town hall; St. Marylebone Borough Council 150,000*l.* for electric-lighting purposes; Stoke Newington Borough Council 3,000*l.* and 13,750*l.* (sanction) for electric-lighting purposes; Woolwich Borough Council 5,000*l.* for town hall and offices, 10,000*l.* for baths, and 1,030*l.* for advances under the Small Dwellings Acquisition Act, 1899.

London County Council Westminster Technical Institute.—On the recommendation of the Education Committee, it was agreed :—

"(*a*) That the estimate of 24,580*l.* submitted by the Finance Committee be approved.

(*b*) That expenditure on capital account not exceeding 24,580*l.* be sanctioned in respect of the erection of the new buildings of the London County Council Westminster Technical Institute.

(*c*) That tenders be invited for the erection of the buildings of the London County Council Westminster Technical Institute; and that separate tenders be invited from selected firms for the installation of ventilating appliances."

Pupil Teachers' Centre, Hilldrop-road Site, Islington, N.—On the recommendation of the same Committee, it was agreed :—

"That the estimate of 5,883*l.* submitted by the Finance Committee in respect of (i.) the purchase of the freehold interest of Batson's trustees in the Hilldrop-road site (Islington, N.), and (ii.) the claim (exclusive of legal expenses) of Messrs. W. Gregar & Son, the contractors, for the erection of the centre, be approved.

That expenditure on capital account not exceeding 5,883*l.* in respect of (i.) the purchase of the freehold interest of Batson's trustees in the Hilldrop-road site (Islington, N.), and (ii.) the claim (exclusive of legal expenses) of Messrs. Gregar & Son, the contractors, for the erection of the centre, be sanctioned; and that a notice to treat be served upon Batson's trustees immediately after the Royal assent is given to the General Powers Bill.

That the Education Committee be authorised to arrange for the settlement of the claim of Messrs. Gregar & Son so soon as the Royal assent is given to the General Powers Bill; and that instructions be given to the contractors to complete the erection of the building in accordance with the plans and specification."

School, Wandsworth.—The Education Committee recommended :—

"(*a*) That the estimate of 22,333*l.* submitted by the Finance Committee in respect of the erection of a school to provide accommodation for 840 children on the Sellincourt-road site (Wandsworth) be approved.

(*b*) That expenditure on capital account not exceeding 23,204*l.* be sanctioned in respect of the erection of a school on the Sellincourt-road site (Wandsworth); that the erection of the building be carried out without the intervention of a contractor; and that the drawings, specification, quantities, and estimate of 21,200*l.* be referred to the Works Committee for the purpose."

The recommendations were carried.

The Works Committee.—On the reception of the report of the Works Committee submitting the statement of works completed during the half-year ended March 31 (for details, see our issue for July 22).

Mr. E. White said that there was very little to find fault with in the management of the Works Committee now, and he congratulated them on what had been accomplished. There was no evidence, however, that, if the whole sum involved in present undertakings was reported upon, it would not alter the result, but he hoped it would not.

Mr. Burns, M.P., said that the question of the Works Department was a closed incident now, and the Department was a recognised institution.

Mr. Torrance (Chairman of the Committee) said that they got good work for the wages paid. He believed in London doing as much of its work as was possible, because he believed that, in that way, the work would be better done.

The report was then adopted.

Waterloo Bridge Lamps.—The Bridges Committee reported that, after consultation with Mr. George Frampton, R.A., and Sir William Richmond, R.A., they had decided to recommend that the original bronze gas lamp-standards on Waterloo Bridge should be reinstated in place of the electric-light standards put up some years ago. Further, that the standards should be adapted for incandescent light, the cost of making the change being estimated at 650*l.* It was claimed that the reversion to the old standards, besides having the effect of bringing the lighting arrangements into keeping with the structure of the bridge, would result in a considerable annual saving of cost, while the light would be equally good.

Mr. Burns, M.P., said he had not succeeded in finding out who was responsible for removing the lamps. The lamps, which were an integral part of the beauty of the bridge, were needlessly removed.

Mr. Horniman said it was the duty of the Council, not only to improve London, but to keep what it possessed of beauty.

The recommendations of the Committee were agreed to.

Banstead Asylum.—The Asylums Committee reported that in March, 1904, the Council voted a sum of 1,000*l.* for the preparation of preliminary plans, etc., in connexion with the erection of permanent buildings at the Banstead Asylum to accommodate 300 male patients, to replace the existing temporary buildings. The proposal is to construct permanent one-story buildings of similar design to the temporary buildings, utilising the present foundations and also, as far as possible, the joinery work, sanitary fittings, gas and water services, heating system, rainwater pipes, drains, etc. An estimate had been prepared by Messrs. J. G. Mann & Son, quantity surveyors, amounting to 25,933*l.*, based upon 6½d. per foot cube (86*l.* 8s. 10d. per bed). The approximate estimate of the asylum's engineer, however, is based upon 7½d. per foot cube, and amounts to 30,763*l.* (102*l.* 10s. 10d. per bed). The Committee recommended, and it was agreed :—

"(*a*) That the estimate of 30,763*l.* to be submitted by the Finance Committee for the erection of permanent buildings at the Banstead Asylum, to accommodate 300 male patients, to replace the temporary buildings there, be approved.

(*b*) That expenditure not exceeding 30,763*l.*, based on the figures of the asylum's engineer, be sanctioned for the erection of permanent buildings at Banstead Asylum to accommodate 300 male patients."

New Fire Station in Substitution for the Knightsbridge Station.—The Fire Brigade Committee recommended, and it was agreed :—

"(*a*) That the estimate of 14,600*l.*, submitted by the Finance Committee, in respect of the erection of the new Knightsbridge fire-station, be approved.

(*b*) That expenditure not exceeding 14,350*l.* be authorised in respect of the erection of the new Knightsbridge fire-station.

(*c*) That expenditure not exceeding 250*l.* be authorised for the taking out of quantities of the work to be done in connexion with the erection of the new Knightsbridge fire-station."

Housing: New King's-road Site, Fulham—Erection of Bearcroft-buildings.—The Housing of the Working Classes Committee recommended, and it was agreed :—

"(*a*) That the estimate of expenditure on capital account of 10,475*l.*, submitted by the Finance Committee, be approved in respect of the erection of Bearcroft-buildings, in New King's-road, Fulham, for the accommodation of persons of the labouring class to be displaced by the Council in connexion with the Fulham Palace-road and High-street improvement.

(*b*) That expenditure not exceeding 10,475*l.* be sanctioned in respect of the erection of Bearcroft-buildings, New King's-road, Fulham, together with all expenses incidental to the work."

[The dwellings will contain accommodation for 220 persons in ten tenements of two rooms and thirty tenements of three rooms.]

London-street Site, Ratcliff—Erection of Bekesbourne-buildings (first section).—The same Committee recommended :—

"(*a*) That the estimate of expenditure on capital account of 17,650*l.*, submitted by the Finance Committee be approved in respect of the erection of the first section of Bekesbourne-buildings in London-street, Ratcliff, for the accommodation of persons of the labouring class to be displaced by the Council on the north side of the Thames through the construction of Rotherhithe Tunnel.

(*b*) That expenditure not exceeding 17,650*l.* be sanctioned in respect of the erection of the first section of Bekesbourne-buildings, London-street, Ratcliff, together with all expenses incidental to the work."

The recommendations were carried.

Garden-row Area, St. Luke—Erection of Chadworth-buildings.—They also reported as follows :—

"The Garden-row, etc., scheme provides for the clearance of four insanitary areas known as Garden-row, Roby-street, Baltic-street, and Honduras-street areas respectively in the parish of St. Luke, Finsbury, and the Council is under obligation to erect dwellings for the accommodation of 1,193 persons of the working classes displaced. The Roby-street area was first cleared, and dwellings containing accommodation for 496 persons have since been provided on the site. Upon the completion of those dwellings steps were taken, with the approval of the confirming authority, to demolish the buildings on the Garden-row area, and as this work has been completed the Council is now in a position to proceed with the erection of working class dwellings upon the site. . . . The dwellings, which will be known as Chadworth-buildings, will contain accommodation for 720 persons in fifty-eight tenements of two rooms, sixty-seven tenements of three rooms, and nine tenements of four rooms, one three-roomed cottage, and one four-roomed cottage. The buildings, which will have frontages to Central-street and Lever-street, will also contain nineteen shops. We think it desirable, however, that the work of fitting up the shops should not be included in the specification for the erection of the main building, so that fittings may be supplied to suit the requirements of intending tenants, and the settlement of the account for the building work my not be unduly delayed. Being of opinion that the work of erecting the dwellings should be executed without the intervention of a contractor, we asked the Works Committee whether they were prepared to undertake it at the amount of the estimate, viz., 34,900*l.*, and the Works Committee have expressed their willingness to do so. The estimate submitted to the Finance Committee contains sufficient provision to meet the cost of fitting up the shops and other incidental expenses. We recommend—

(*a*) That the estimate of expenditure on capital account of 40,135*l.* submitted by the Finance Committee, be approved in respect of the erection of Chadworth-buildings, Garden-row site, St. Luke, Finsbury, for the accommodation of persons of the labouring class displaced by the Council under the London (Garden-row, etc., St. Luke) Improvement Scheme, 1899.

(*b*) That expenditure not exceeding 40,135*l.* be sanctioned in respect of the erection of Chadworth-buildings, Garden-row site, St. Luke, Finsbury, together with all expenses incidental to the work; that the work of erecting the buildings be carried out without the intervention of a contractor; and that the working drawings, specification, bills of quantities, and estimate of 34,900*l.* be referred to the Works Committee for that purpose."

The recommendations were agreed to.

Tramways.—The Highways Committee recommended :—

"That the estimate of expenditure on capital account of 59,394*l.*, made up of the undermentioned amounts, submitted by the Finance Committee, be approved in respect of the equipment of the tramways from the Strand, via the tramway-subway, to Theobald's-road, and the reconstruction and equipment of the tramways in Theobald's-road between the present tramway terminus and the authorised tramways in Rosebery-avenue, near Gray's-inn-road, namely :—

Rolling stock	£33,000
Trackwork	19,870
Cables, switchboards, etc.	5,024
Lighting, etc.	1,500
	£59,394

That the Highways Committee be authorised to make any necessary arrangements with the North

Metropolitan Tramways Company for the electric working, as a through route, of the tramways in the tramway-subway between the Strand and Southampton-row, and of the tramways between Theobald's-road and the "Angel," Islington.

That capital vote of 400*l.* approved on July 14, 1903, in respect of preliminary expenses in connexion with the erection of the Jew's-row (Wandsworth) car-shed, be cancelled.

That the estimate of expenditure on capital account of 53,630*l.*, submitted by the Finance Committee, namely, 37,810*l.*, in respect of the rebuilding of the tramways car-shed at Jew's-row, Wandsworth, and 15,820*l.* in respect of the erection of sub-stations at Battersea and Wandsworth, for the electrical working of portions of the London County Council Tramways, be approved.

That expenditure on capital account of sums not exceeding 36,810*l.* in all, be sanctioned in respect of (1) the rebuilding of the Jew's-row, Wandsworth, car-shed of the London County Council tramways; (2) the execution of paving works, the laying of rails and the construction of conduits in, and in connexion with, the car-shed; and (3) the wiring and fitting of the car-shed for electric lighting, etc.

That the erection of the superstructure of the tramways car-shed at Jew's-row, Wandsworth, be carried out without the intervention of a contractor, and that the drawings, specification, and estimate of 29,000*l.* be referred to the Works Committee for that purpose.

That the paving works, the laying of the rails, and the construction of the conduits required for the Jew's-row, Wandsworth, car-shed be done by the Council's permanent way staff under the supervision of the chief officer of tramways.

That the wiring and fitting of the Jew's-row, Wandsworth, car-shed for electric lighting, etc., be done by the electrical staff of the tramways department, under the supervision of the chief officer of tramways.

That expenditure, on capital account, of sums not exceeding 15,820*l.* in all, be sanctioned in respect of (1) the erection of the Battersea and Wandsworth sub-stations of the London County Council tramways; (2) the wiring and fitting of the buildings for electric lighting, etc.; and (3) the execution of the paving works in connexion with the sub-stations.

That the erection of the Battersea and Wandsworth sub-stations be executed without the intervention of a contractor, and that the drawings and specifications and estimates of 6,250*l.* and 7,360*l.*, respectively, be referred to the Works Committee for that purpose.

That the paving works, etc., in connexion with the Battersea and Wandsworth sub-stations be executed by the Council's permanent way staff, under the supervision of the chief officer of tramways.

That the wiring and fitting for electric lighting, etc., of the Battersea and Wandsworth sub-stations be executed by the electrical staff of the tramways department, under the supervision of the chief officer of tramways.

That the estimate of 30,000*l.* of expenditure on capital account, submitted by the Finance Committee, in respect of the construction of the foundations and the erection of the chimneys for the second portion of the Greenwich electricity generating station be approved.

That expenditure, on capital account, not exceeding 30,000*l.*, be sanctioned in respect of the construction of the foundations and the erection of the chimneys for the second portion of the Greenwich electricity generating station.

That the drawings, specification, and estimate of 28,000*l.* for the construction of the foundations and the erection of the chimneys for the second portion of the Greenwich electricity generating station be referred to the Works Committee, with a view to the execution of the work without the intervention of a contractor.

That authority be sought in the session of Parliament of 1906 to confer upon the Council the powers included in the London County Council (Tramways) Bill, 1905, namely:—

Construction of tramways from the Westminster Bridge-road terminus, via Westminster Bridge, Victoria Embankment, and Blackfriars Bridge, to the Blackfriars-road terminus, with the necessary junctions.

Extension of the tramways in the tramway-subway from the Strand to join the aforesaid lines near Waterloo Bridge.

Diversion of a portion of the tramway-subway near Waterloo Bridge.

Construction of electric tramways over the new Vauxhall Bridge.

Construction of tramways from the county boundary near the junction of Crystal Palace-parade and Anerley-road, via Crystal Palace-parade, to a point near the central transept entrance to the palace.

Diversion of a portion of the tramways from Lewisham High-road to Forest Hill via Stondon Park, instead of along a portion of Brockley Rise; and

Construction of such of the new tramways authorised by the London County Tramways Act, 1900, the powers in respect of which have not yet been exercised.

That authority be sought in the session of Parliament of 1906 to enable the Council to construct loop-lines along Curtain-road and Harwar-street respectively, as alternative routes to single line sections of the existing tramways in Old-street and Kingsland-road.

That, subject to the approval of the estimate of 59,394*l.*, submitted by the Finance Committee, expenditure on capital account, not exceeding 17,068*l.*, be sanctioned for the execution of the road-work in connexion with the reconstruction of the tramways in Theobald's-road, between the existing terminus and Rosebery-avenue.

That expenditure, on capital account, not exceeding 1,421*l.*, be sanctioned, in respect of the electrical equipment of the trackwork of the tramways from Holborn Town Hall via Rosebery-avenue and St. John-street-road to the "Angel," Islington.

That the offer of Messrs. J. Mowlem & Co., Limited, to execute, as an addition to the work under the contract entered into with them under the resolution of January 31, 1905, for the construction of tramways along Rosebery-avenue and St. John-street-road (i.), the road-work (exclusive of the supply of special work) in connexion with the reconstruction of the tramways in Theobald's-road, between the present terminus and Rosebery-avenue, and (ii.) the electrical equipment for the trackwork of the new tramways from Holborn Town Hall via Rosebery-avenue and St. John-street-road to the "Angel," Islington, be accepted.

That, subject to the approval of the estimate of 59,394*l.*, submitted by the Finance Committee, expenditure, on capital account, not exceeding 5,335*l.*, be sanctioned for the supply of the special trackwork required for the reconstruction of the tramways in Theobald's-road, between Rosebery-avenue and the existing terminus.

That the offer of the Hadfield Steel Foundry Company, Limited, to supply, for the sum of 8,335*l.*, the special trackwork for the tramways from Rosebery-avenue, via Theobald's-road and the tramway-subway, to the Strand, be accepted.

That the Highways Committee be authorised to obtain sixteen single-deck cars for use on the through tramways route between the Strand and the "Angel," Islington.

That the operation of standing order No. 23, which requires that all tenders where the estimated expenditure exceeds 500*l.* shall be opened in the Council by the chairman, be suspended so far as regards the tenders for the supply of thirty-four single-deck electric cars for use on the through tramways route between the Strand and the "Angel," Islington.

That, subject to the approval of the estimate of 59,394*l.*, submitted by the Finance Committee, expenditure, on capital account, not exceeding 1,500*l.*, be sanctioned in connexion with the wiring and fitting for electric lighting of the tramway-subway between the Strand and Southampton-row."

The various recommendations were agreed to.

Westminster Improvement—Paving, etc.—The Improvements Committee recommended, and it was agreed:—

"(*a*) That the working drawings, bills of quantities, specification, and estimate (4,100*l.*) of the cost of the paving, etc., works, in the new street between Horseferry-road and Smith-square to be formed in connexion with the Westminster improvement, authorised by the London County Council (Improvements) Act, 1900, be approved, and be referred to the Works Committee, with a view to the works being executed without the intervention of a contractor.

(*b*) That the employment of a clerk of works in connexion with the paving, etc., works, in the new street between Horseferry-road and Smith-square, be authorised at a cost not exceeding 75*l.*"

Main Drainage Extension—Northern Low-level Sewer No. 2—Section West of Counter's-creek Sewer.—The Main Drainage Committee recommended, and it was agreed:—

"(*a*) That the estimate of 119,500*l.*, submitted by the Finance Committee for the construction of the portion of the northern low-level sewer No. 2 west of Counter's Creek sewer and for general incidentals, be approved.

(*b*) That expenditure not exceeding 117,000*l.* be sanctioned for the construction of the portion of the northern low-level sewer No. 2 west of Counter's Creek sewer; that the work be done without the intervention of a contractor; and that the drawings, specification, and estimate of 117,000*l.* be referred to the Works Committee for that purpose.

(*c*) That expenditure not exceeding 2,500*l.* be sanctioned for general incidental expenses, including the cost of the employment of assistant engineers, clerks of works, and inspectors required in connexion with the supervision of the work."

Bridge over Surrey Canal, Neate-street, Camberwell.—On the recommendation of the Parliamentary Committee, it was agreed that, on the understanding that the Council of the Metropolitan Borough of Camberwell will defray the cost involved, and render all necessary assistance, Parliamentary powers be sought in the session of 1906 to enable the borough council to expend an additional 1,200*l.* in the construction of a bridge over the Grand Surrey Canal between St. George's-road and Neate-street, Camberwell.

Limehouse Pier.—The Rivers Committee recommended, and it was agreed:—

"That, subject to the approval of the Thames Conservancy being obtained to the proposed construction of Limehouse Pier . . . the offer of the Westminster Construction Company, Ltd., to carry out the work in connexion with the construction of the pier for the sum of 3,294*l.* as an extra on their existing contract in respect of Millwall, Hammersmith (Weltje-road), Putney, Wandsworth, Battersea-square, and Nine Elms piers be accepted. . . ."

Theatres, etc.—The Theatres and Music Halls Committee submitted several applications in regard to theatres, etc., and consent was given in the following cases:—

"To Messrs. Blow & Billerey (reconstruction of the auditorium at the Avenue Theatre); to Mr. A. Cole (alterations at the Café Vaudeville, Strand); to Messrs. E. Runtz & Ford, for Mr. G. Edwardes (for rearrangement of stalls seating at Daly's Theatre); to Mr. A. W. S. Cross (reconstruction of Shoreditch Town Hall)."

Victoria-embankment—Remetalling, etc.—The Bridges Committee recommended, and it was agreed:—

"That expenditure, not exceeding 3,250*l.*, be sanctioned for the remetalling of the carriageway and for certain repairs to the footways of the Victoria-embankment; that the work be executed by the Council without the intervention of a contractor; and that the specification, drawings, etc., be referred to the Works Committee for that purpose."

Bethnal Green Fire Station—Enlargement and Alteration.—On the recommendation of the Fire Brigade Committee, it was agreed:—

"That the estimate of 5,525*l.*, submitted by the Finance Committee in respect of the enlargement and alteration of the Bethnal Green fire-station, be approved.

That the tender of Messrs. J. & F. May to provide a hot water installation at the Bethnal Green fire-station for 229*l.* 10*s.* be accepted; that the solicitor do prepare and obtain the execution of the necessary contract; and that the seal of the Council be affixed to the contract when ready."

New "Morning Post" Office.—The Improvements Committee recommended:—

"That approval be given under section 40, subsection 13, of the London County Council (Improvements) Act, 1899, to the Strand and Aldwych elevations and exterior design of the building to be erected by Lord Glenesk for the reinstatement of the *Morning Post* premises, as shown upon the plans presented to the Improvements Committee on July 26, 1905."

Mr. Lewin Sharpe suggested that some representation should be made to the architect to treat the building other than by erecting a dome, seeing that it was so near the Gaiety Theatre.

Capt. Hemphill, in reply, said he had been in negotiation with the proprietors for some time. The building had been much improved; the dome was much better than originally proposed; the building was to be of granite, and would probably be one of the finest in London.

The recommendation was agreed to.

The Council adjourned for the summer holidays soon after nine o'clock until October 10.

Illustrations.

WESLEYAN HALL COMPETITION DESIGN.

IN this scheme the author endeavoured to fulfil the requirements as set forth in the particulars of competition without allowing them to interfere with the monumental character of the building. In setting out the plan the position of the main hall was fixed central on site, with the main axis east and west, being carried up so as to form the centre feature of the block, and the subsidiary apartments were grouped round about.

The main entrance to the great hall was arranged from Princes-street, leading to the entrance-hall, with retiring-rooms on either side, and the main stairs adjoining led to crush at end of the great hall on the first floor, which was flanked by a general reading-room and conference hall, doors being provided out of the same so that in case of large receptions the whole area of the site, except the portion reserved for letting offices at the back, was available for these functions. Off the crush hall, stairs leading to the communication corridor linking up the galleries were provided, and special consideration was given to exits from the same. The small hall and reference library were placed over crush to main hall, with committee-rooms and departmental offices over.

The estimated cost of the building was 123,763*l.* E. VINCENT HARRIS.

SKETCHES WITH THE ARCHITECTURAL ASSOCIATION IN NORMANDY.

THESE sketches are given in connexion with the excursion to Normandy of the Architectural Association, which has just taken place, and they were to have accompanied a report in this issue by one of the party. Up to the time of going to press our contributor's copy has not arrived, though it was posted to us on Tuesday night. Next week, when we shall publish other sketches, we hope to give an account of the excursion.

AN AMERICAN ACADEMY AT ROME.—From a paragraph in an Italian paper we learn that the Americans are about to found an American academy at Rome, on the same lines as that of the French academy at the Villa Medici. It is another instance of the curious way in which America follows the French lead in everything connected with art.

APPLICATIONS UNDER THE LONDON BUILDING ACT, 1894.

THE London County Council at their meeting on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses :—

Lines of Frontage and Projections.

Deptford.†—Two iron and glass shelters at the "New Cross Empire" Music Hall, to abut upon New Cross-road and Watson-street, Deptford (Messrs. F. Matcham & Co.).—Consent.

Marylebone, East.—Residential flats, with bay windows, upon the site of Nos. 79 to 105 (odd numbers only) inclusive, Park-road, Regent's-park (Sir Arthur Blomfield & Sons for Mr. H. Johnson). [Taken back in order that a map may be prepared to show what is proposed.

Width of Way.

Southwark, West.†—Cottages on the eastern side of Bear-lane, Southwark (Mr. W. C. Jones for Messrs. Armstrong, Whitworth, & Co.).—Consent.

Lines of Frontage and Construction.

Finsbury, Central.†—An addition to an iron gangway connecting the first floors of Nos. 67, 68, and 69, Turnmill-street, and No. 3, Printer's-buildings, Broad-yard, Finsbury (Mr. R. A. Jack for Messrs. R. S. Murray & Co.).—Consent.

Lines of Frontage and Projections.

Strand.—Iron and glass shelters in front of the Waldorf Theatre, Aldwych, and Catherine-street, Strand (Messrs. Jones & Willis, Ltd.).—Consent.

Strand.—Oriel windows and a balcony and porches to Nos. 166 to 173, Piccadilly (Mr. W. Woodward).—Consent.

Hampstead.—An iron and glass porch at No. 26, Lyndhurst-road, Hampstead (Mr. T. Wilson for Mr. J. Van den Bergh).—Consent.

Kensington, South.—New buildings of a porch at the angle of High-street and Hornton-street, and a porch at the angle of High-street and Campden Hill-road, Kensington (Messrs. Chesterton & Sons for Messrs. C. A. Daw & Son).—Consent.

Kensington, South.—One-story shops on part of the forecourts of Nos. 24 and 26, Harrington-road, Kensington (Mr. F. E. Williams for Lord Ashburton).—Consent.

Kensington, South.—One-story shop on part of the forecourt of No. 28, Harrington-road, Kensington (Mr. F. E. Williams for Lord Ashburton).—Consent.

Lewisham.—An iron and glass covered way in front of No. 153, High-street, Lewisham (Mr. A. L. Guy).—Consent.

Lewisham.—Porches to sixteen houses on the west side of Birkhall-road, Hither-green (Messrs. Norfolk & Prior for Mr. W. Rolfe).—Consent.

Paddington, South.—Erection at No. 37, Gloucester-square, Paddington, to abut upon Radnor-place, of a water-closet addition on the basement and ground story, a projecting bay-window on the ground floor, and a projecting enclosure to a water-closet on the second floor (Messrs. Waring & Gillow for Mr. C. Oliverson).—Consent. (The erection of the proposed water-closet on the lead flat at the second floor level.—Refused.)

Strand.—A building with architectural projections and a balcony on the site of St. Philip's Chapel, Regent-street (Mr. F. E. Williams for Mr. J. W. Lorden).—Consent.

Wandsworth.—Porches to a pair of semi-detached villas, on the west side of Enmore-street, Putney (Mr. J. C. Radford for Mr. W. H. George).—Consent.

Wandsworth.—A porch and sham half-timber work to a detached house on the east side of Enmore-street, Putney (Mr. J. C. Radford for Mr. E. R. Parry).—Consent.

Hammersmith.—A building upon a site abutting upon the southern side of Dalgarno-gardens and the western side of Bracewell-road, Hammersmith (Mr. A. Dawkins for Mr. P. Tinckham).—Refused.

Islington, East—Four one-story shops on a site abutting upon the southern side of Drayton-park and the eastern side of Arvon-road, Islington (Messrs. F. Chambers & Sons).—Refused.

Woolwich.—A one-story shop on part of the forecourt of No. 2, Wellington-street, Woolwich (Mr. E. H. Wright for Messrs. Dents, Ltd.).—Refused.

Width of Way.

Stepney.†—A one-story building at the rear of No. 12, Heath-street, Stepney, with external walls at less than the prescribed distance from the centre of the roadway of Old Church-road (Mr. W. F. H. Crawley for Mr. L. Cooperstein).—Consent.

Kensington, North.—For the retention of a one-story building on a site abutting upon Walmer-road and Hesketh-place, Kensington (Mr. W. Weaver for the Council of the Royal Borough of Kensington).—Consent.

Width of Way and Lines of Frontage.

Hoxton.—Four workshops in Providence-place, Scrutton-street, Hoxton (Mr. G. H. Lovegrove for Mr. R. Darby).—Consent.

Hampstead.—An iron and glass covered way in front of "Normanhurst," Priory-road, West Hampstead, to abut upon Canfield-gardens (Messrs. Baker & May for Mr. F. P. Scholte).—Consent.

Line of Frontage and Construction.

Poplar.—The erection over a street leading out of the west side of Emmett-street, Poplar, of an iron gangway to connect the premises of Messrs. Venesta, Ltd., with the premises of the Aberdeen Steam Navigation Company (Fireproof Company, Ltd., for Messrs. Venesta, Ltd.).—Consent.

Width of Way, Line of Frontage and Space at Rear.

St. George, Hanover-square.—Buildings on a site abutting upon a new street, to lead out of Ebury-street, and also upon Grosvenor-gardens-mews, North, Pimlico (Mr. A. F. Faulkner for Mr. Willett).—Consent.

Formation of Streets.

Wandsworth†.—That an order be issued to Mr. W. N. Dunn sanctioning the formation or laying out of new streets for carriage traffic, to lead out of the north side of Streatham-common North to Deepdene-road, Wandsworth, and in connexion therewith the widening of portions of Streatham-common North and Deepdene-road (for Mr. H. N. Grenside).—Consent.

Dulwich.—That an order be issued to Mr. C. E. Barry sanctioning the formation or laying out of a new street for carriage traffic, to lead from Dulwich-village to Turney-road, Dulwich (for the Governors of Alleyn's College).—Consent.

Kensington, North.—That an order be issued to Messrs. Trant Brown & Humphreys sanctioning the formation or laying out of new streets for carriage traffic on the St. Quintin Estate, Quintin-avenue, Kensington (for Mr. W. H. St. Quintin).—Consent.

Greenwich.—That an order be issued to Messrs. Crickmay & Heath, refusing to sanction the formation or laying out of a new street for carriage traffic to lead out of the south side of the Westcombe-park-road, to the east side of Mycenæ-road, Greenwich (for Mr. W. C. Johnson).—Refused.

Wandsworth.†—That an order be issued to Mr. A. Wellings refusing to sanction the formation or laying out of new streets for carriage traffic on a site abutting upon the east side of Trinity-road and the south side of Upper Tooting-park, Wandsworth, and in connexion therewith the erection of buildings upon such site.—Refused.

Space at Rear.

Lewisham.—A modification of the provisions of section 41 with regard to open spaces about buildings, so far as relates to the proposed erection of four houses on the western side of Wallbutton-road, Brockley, with irregular open spaces at the rear (Mr. T. H. Sawyer).—Consent.

Lewisham.—A modification of the provisions of section 41 with regard to open spaces about buildings so far as relates to the proposed erection of a building on the eastern side of Garthorne-road, Honor-oak-park, with an irregular open space at the rear (Mr. G. Dunsmure for Messrs. Dunsmure Brothers).—Consent.

Deviation from Certified Plans.

Strand.—Certain deviations from the plan certified by the District Surveyor under section 43 of the Act, so far as relates to the proposed rebuilding of No. 3, Lower John-street, Golden-square (Mr. W. Lockwood for Mr. J. Madge).—Refused.

Cubical Extent.

Kennington.—For the erection at Beulah Laundry, South Lambeth-road, Kennington, of a building exceeding in extent 250,000 but not 450,000 cubic ft. (Messrs. Treadwell & Martin for Messrs. Rogers & Cook).—Refused.

Battersea.—An addition to a machine shop at Ransomes-wharf, Wellington-road, Battersea, and the omission of a layer of concrete over the site of such machine-shop (Messrs. Drew Bear, Perks, & Co., Ltd.).—Consent.

The recommendations marked † are contrary to the views of the local authority.

HOSPITAL EXTENSION, MILTON, HAMPSHIRE.—On the 20th ult. the foundation-stone of the new block which is to be added to the Infectious Diseases Hospital at Milton was laid. The building will contain two main wards, with twelve beds each, together with four "acute" wards and an observation ward. There will also be accommodation for the nurses, while the heating will be accomplished by means of hot-water pipes and radiators, with Manchester stoves. The contractor for the work, as well as for the building of a boundary wall, is Mr. M. Coltherup. The plans were prepared in the office of the Borough Engineer. Mr. C. W. Ball dealt with the quantities, and Mr. Burr is the clerk of the works.

Correspondence.

THE LATE MR. JOSEPH FOSTER, M.A.

SIR,—Though I never had the pleasure of knowing the late Mr. Joseph Foster, M.A., the learned genealogist and antiquary, whose death is just announced, it is well not to forget that if any man ever did enjoy (?) the honour of suffering no little ill-merited criticism for trying to speak the truth, it surely was he. Anyone who possesses a copy of his "Peerage and Baronetage" may live to be assured of its value if kept long enough! Whatever may be thought of his wide learning as a genealogist, there cannot, I think, be two opinions that, for bravely-drawn heraldries, that book has rarely, if ever, been beaten, and his pages, showing the descent of Queen Victoria, and others, teem with interest to all lovers of historical science; my own copy, 1881, now all to pieces with much usage, is a silent testimony of the deep interest it has afforded myself, and all I can now do is to try and keep his memory green by placing it on record. That such a costly and laborious effort should not have been continued year by year is, I believe, solely due to the preference for romance to reality, though, so far as I know, even disputed points in his "Chaos" were never given to the public as final, but were expressly described by him as tentative only.

He was a nephew of Birket Foster, and himself a descendant of an old family.

E. SWINFEN HARRIS.

The Student's Column.

STEAM BOILERS AND PIPES.—V.

FEED-WATER HEATING (*continued*).

IN addition to increasing the productiveness of a steam boiler, the employment of feed water at a temperature approaching that within the boiler itself has an important effect in minimising the alternate expansion and contraction, which would otherwise cause serious strains to the structure and materially shorten its life.

So great are the advantages of employing feed water at a temperature nearly approaching the boiling point corresponding with the pressure adopted, that live steam is more economical than exhaust steam as a heating medium. This result appears somewhat paradoxical, yet the facts are beyond dispute.

Many years ago Mr. James Weir proved that fuel could be saved by heating feed water with steam taken from the first intermediate receiver of a triple-expansion engine. Later, Mr. John Kirkaldy demonstrated the economy to be secured by heating feed water with live steam drawn direct from the boiler. In spite of arguments intended to show the absurdity of these methods, both of them have been largely applied to marine and land boilers with admittedly beneficial results.

Mr. Druitt Halpin afterwards introduced the "thermal storage" system of dealing with feed water for boilers. The apparatus required for this system is very simple, consisting essentially of a cylindrical water vessel fixed above the boiler and connected with it by a stand-pipe of suitable diameter. This pipe forms a permanent connexion between the steam space of the boiler and the storage cylinder, so that the pressure and temperature in both are always equal. All feed water is introduced through the storage cylinder, where it is heated to full boiler temperature by passing through the steam. Water enters the boiler through a feed-regulating cock, which is operated by means of a spindle passing through the front end of the cylinder. During times of light load the cylinder can be filled up, when the water is heated by live steam, represented in great part by the surplus steam that, in ordinary circumstances, would blow off from the safety valve. The heat so stored is returned to the boiler in the feed water when the demand for steam again becomes heavy.

It is easy to understand that the conservation and restoration of heat in this way must result in economy during a certain limited number of hours daily, but not so easy to see why the apparatus should be able to effect the important savings during continuous work which have been obtained in practice.

The first thermal storage plant on Mr. Druitt Halpin's system was installed above two Cornish boilers in a large London hotel,

where steam was required for electric light and laundry engines, pumps for hydraulic lifts, cooking and heating apparatus, and hot-water supplies. Each boiler measured 26 ft. 6 in. long by 5 ft. 6 in. diameter, and the storage cylinder measured 25 ft. long by 4 ft. diameter. Before thermal storage was adopted the boilers were evaporating 10 lb. of water per pound of coal from and at 212 deg. F.

Two series of trials were made under the direction of Professor Unwin for the purpose of comparison, each series extending over one week. During the first trials one of the boilers was worked in the ordinary manner and the other was shut down. All coal was weighed, and the feed water measured by a Schönheyder meter. During the second trials the other boiler was taken into service and fed through the thermal-storage cylinder. Readings of the electrical output, records of lift journeys, and estimates of power and heat used in the laundry and elsewhere in the hotel indicated that the requirements of the two weeks were practically equal. The results ascertained by Professor Unwin were certainly surprising, for they showed that the saving of coal during the second week amounted to no less than 19·7 per cent.

Some equally remarkable results have been obtained more recently by Mr. H. W. Miller, M.Inst.C.E., by applying the thermal-storage system to watertube boilers capable of evaporating 12,000 lb. of water per hour. After the thermal-storage apparatus had been fitted it was found that the same boilers were able to generate as much as 25,000 lb. of steam per hour, and at the same time to effect an appreciable saving of fuel per pound of water evaporated.

The greatly increased output obtained by Mr. Miller points to a far less expensive way of providing additional supplies of steam than the usual expedient of laying down a second boiler. Conversely, it shows that, for a given output, a much smaller boiler may be employed if thermal storage be applied than would otherwise be the case. The direct saving so rendered possible, and the additional savings to be realised by reduction of land area and the dimensions of boiler-house buildings are distinct inducements for the architect to inquire carefully into the merits of the system.

Messrs. Booth & Kershaw, in a paper read before the Institution of Electrical Engineers, suggest that the gain observed when feeding boilers with water at high temperature may be attributed in a measure to the avoidance of convection currents absorbing a portion of the heat energy of the fuel and converting it into mechanical work. This may account for some part of the benefit derived from thermal storage, but it does not explain why the system should be able to give results that cannot be attained by the use of fuel economisers and live steam heaters, also furnishing feed water at high temperature. The probability is that the success of the system owes much to the absolute equality of temperature in the storage cylinder and the boiler alike, and to the perfect regularity with which the feed water descends by gravity from the cylinder to the boiler below.

The process of steam generation is very readily disturbed, and we may find in the success of the cylinder feed a suggestion that existing methods of feeding boilers might be altered with considerable advantage.

Those who desire to pursue further the general subject of high-temperature boiler feeding will find some suggestive material in a paper read by Mr. A. W. Hamilton before the Belfast Mechanical and Engineering Association in 1902. The author of this communication expresses the opinion that, by raising the temperature of the feed water to the boiling point, the efficiency of the whole heating surface of the boiler is largely increased, because it is employed solely in the generation of steam and has not also to heat the water up to the boiling point.

To make this matter clear, let us take the case of a boiler working at the pressure of 65 lb. per sq. in. The temperature of the water and the boiling point will then be 312 deg. F. First, assume the feed water to be furnished from an exhaust steam heater at 180 deg. F. Then, before any steam can be produced, every pound of the water must receive 132 heat units.

Next, assume water to be supplied from an economiser or a live steam heater at 212 deg. F. In this case each pound of water must receive 100 heat units before the boiling point is reached.

Now assume that the feed water is at the boiling point when delivered to the boiler. Then, instead of a small demand for heat by the comparatively non-receptive water. On the contrary, there is an instant call for heat on a large scale, for every pound of water is in readiness to burst out in the form of steam, and, therefore, to absorb 894 thermal units, this quantity representing the latent heat required to convert one pound of water into steam.

As the process of evaporation necessarily has a cooling effect upon the water, the difference of temperature between the two sides of the boiler plates is increased. Hence the result is a great augmentation in the rate of heat transmission through the plates.

So we have a very reasonable hypothesis accounting for the apparent paradox presented by the economy of live steam heating, especially when the feed water is heated up to the boiling point corresponding with the pressure adopted.

Considerable attention has been devoted to this subject of late, and it is not improbable that the steam boiler of the future may be designed so as to provide facilities for the two distinct operations of raising water to the boiling point and of converting water at that point into steam.

Finally, the reader should bear in mind the fact that all forms of water heater are beneficial for the additional reason that they constitute more or less efficient types of water-softening apparatus. By reducing the proportion of mineral salts entering the boiler, a water heater reduces the thickness of non-conducting scale forming on the inside surfaces, and makes a corresponding reduction in the annual cost of fuel and of boiler cleaning.

It may be added that, in all places where only hard water is available for boiler feeding, it is always desirable to employ a properly-designed softening apparatus, which is far more efficient and more convenient for the intended purpose than any type of water heater.

We do not propose to describe and illustrate the different types of apparatus mentioned in the present article. To do this properly would require much space, and the task is scarcely necessary, as full particulars are readily obtainable from the excellent catalogues published by many well-known manufacturers.

WESTMINSTER CITY COUNCIL.

AT the fortnightly meeting of the Westminster City Council on Thursday last week the General Purposes Committee recommended that Messrs. Thomas Agnew & Sons, of 39B, Old Bond-street, be invited to submit a tender for periodically inspecting and reporting upon the paintings and pictures belonging to the Council.—Agreed to.

Reorganisation of Works Department.—The General Purposes Committee, in a report dealing with the reorganisation of the Works Department, recommended :—(*a*) That the Works Department be divided into three branches—viz., the general, drawing-office, and outdoor. (*b*) That the outdoor branch be sub-divided into two divisions, east and west, with an assistant surveyor in each division to supervise and be responsible to the City Engineer and Surveyor for the staff of the division.—The report was agreed to.

Building Obstruction.—The Highways Committee, having had their attention directed to several instances of obstruction of the streets during the busiest hours of the day by the unloading and loading of machinery, cranes, etc., in connexion with building operations, it was agreed that a condition be attached to licences for hoardings prohibiting the loading or unloading in main streets of any machinery or cranes used in connexion with building operations between the hours of 9 a.m. and 6 p.m.

Sky Signs.—Attention having been called by the Superintendent Architect of the London County Council to the erection of an alleged sky sign at No. 19, Leicester-square, the Town Clerk was instructed to take steps for the removal of such sign.

New Street.—A communication was received from the London County Council stating that it was the intention of that body to form a new street 60 ft. wide between Smith-square and Horseferry-road. It had been suggested that trees should be planted in the street, but as the cost of maintenance of the road would fall on the City Council, the County Council, before proceeding further, wished to learn the views of the City Council on the matter. It was resolved that the City Council should offer no objection, and that they would be prepared to maintain such trees.

Duke of Cambridge Memorial Statue.—Application had been received on behalf of the fund for the memorial to the late Duke of Cambridge for permission to place an equestrian statue on a site in Whitehall opposite the Horse Guards and the new War Office. The base of the statue will be about 10 ft. wide. It was agreed to give the required consent subject to the design of the base being submitted to and approved by the Council.

The Gladstone Statue.—It was resolved to authorise the Chairman and the City Engineer to act in reference to the site in the Strand at the western end of St. Clement Danes Church to be handed over by the London County Council for the Gladstone statue. The Council has provisionally approved of the suggested site.

COURT OF COMMON COUNCIL.

AT a sitting of the Court of Common Council on Thursday last week it was resolved, on the recommendation of the Streets Committee, to enter into the following contracts :—With the Yorkshire Hennebique Contracting Company, for a reinforced concrete wall, etc., to the river wall at Hornchurch Marshes for 6,240*l.* 7s. ; and with Messrs. C. W. Killingback & Co., for the construction of 9-in. pipe sewer and works in Sun-street-passage for 247*l.*

Renovating Buildings.—A report was submitted relative to the sand-blast process for renovating buildings, and it was resolved that Messrs. Farnham, Ltd., be called upon to abate the nuisance.

The City Mortuary.—It was resolved to accept the tender of Messrs. E. Lawrence & Sons to rebuild the portion of the City Mortuary destroyed by fire, at a cost of 1,389*l.*

City of London Cemetery.—On the recommendation of the Sanitary Committee, it was agreed to improve and augment the sanitary arrangements at the church and chapel of the City of London Cemetery at an estimated cost of 240*l.*

GENERAL BUILDING NEWS.

CHURCH, PARKSTONE.—The new church of St. Osmund's, Parkstone, was dedicated recently by the Bishop of Salisbury. The new church is only part—the chancel and north transept—of the projected building, together with structural preparation for future work and a temporary brick nave. The architect is Mr. G. A. Bligh Livesay, and the plan of the church is cruciform, and the central crossing, of which the four great piers are built, is to be surmounted by a dome. The chancel terminates in an apse, with semi-domed vault, and is surrounded by a wide ambulatory, divided from it by Ionic columns. The altar is of teak and carved ebony, with a slab of red Devon marble, and it stands under a baldacchino. Round the sanctuary are places for clergy, with a seat for the bishop in the centre, behind the altar, in basilica fashion. There is some beautiful XVIIth century wrought iron work between the columns of the apse, which was formerly in the Church of St. Mary le Bow, Cheapside, London. This was given by the rector and wardens of St. Mary's, and has been re-modelled and placed in position by Messrs. Seller. The chancel extends under the crossing, and there are two ambones. The floor and steps of chancel, sanctuary, and ambulatory are in terrazzo. There are four stalls for clergy and four for choirmen, as well as seats for ten or twelve choir-boys in the chancel itself, and the rest of the choir will have places in the ambulatory on either side. All the chief permanent work of the interior is of terra-cotta, supplied by the firm of Messrs. Carter & Co., of Poole. The considerable elevation of the chancel floor has given opportunity for a spacious crypt, which has accommodation for the heating apparatus and for the appliances connected with the supply of water, gas, and electricity, as well as for a temporary vestry for clergy and choir. The church will be warmed by hot water on the low-pressure system, and the lighting is partly by gas and partly by electricity. The ornaments of the altar and sanctuary are from the firm of Watts & Co., as is also a processional cross. The organ is by Mr. Johnson, of Bristol. Nearly all the furniture, fittings, and ornaments have been designed by the architect. The ancient font, which has been in use in the iron chapel, has been retained for the new church, and stands in the north-west corner of the nave. The firms who have been employed in the structure and fittings include :—Messrs. Miller & Sons, J. McWilliam & Son, and William Hoare, builders ; Homan & Rogers, steel construction ; Diespeker & Co., marble terrazzo ; William Morris, glass ; Henry Hope & Sons, heating, etc. ; Earp, electric lighting ; Seller & Co., gas and old iron work ; Jones & Willis, sanctuary fittings ; West & Collier, seating ; Anderson & Co. ; Caslake ; and Blackwell & Co. Mr. F. Broad prepared the quantities.

About 5,000*l.* has been expended on the chancel, north transept, and temporary nave, and it is estimated that the whole church, when completed, with vestries, side chapel, aisles, campanile, and baptistery, would cost 12,000*l.*—*Bournemouth Observer.*

ST. MARK'S CHURCH, HARROGATE.—St. Mark's Church at Harrogate was consecrated by the Bishop of Ripon on Saturday last week. The building has been erected of Pateley stone, from the designs of Mr. J. Oldrid Scott, and at present the church consists of nave and chancel. The nave was built about five or six years ago, at a cost of some 9,000*l.*, the site having been given by Mr. John Paley. The chancel has only lately been added, and its cost is estimated at about 6,500*l.* In due time it is proposed to erect a tower.

CHURCH, MURROE, COUNTY LIMERICK.—The new Church of the Holy Rosary at Murroe is nearing completion. The church is of Romanesque character, and was designed by, and is being erected under the care of, Mr. O'Malley, architect, Limerick.

ROMAN CATHOLIC CHURCH, READING.—The Bishop of Portsmouth (the Rev. John Baptist Cahill) recently laid the foundation-stone of a new Roman Catholic Church on a piece of land acquired in the Upper Redlands-road. The building when completed will be 90 ft. long and 50 ft. wide, with seating capacity for 450 persons, but until sufficient money is raised the erection of the sanctuary will remain in abeyance, and a building 63 ft. long by 24 ft. wide, capable of holding 200 persons, will be erected. The architects are the Rev. Canon A. J. C. Scoles and Mr. G. Rayment, of Basingstoke, whilst the builder is Mr. Herbert, of Playhatch, Caversham.

BAPTIST CHURCH, SOUTH BANK, YORKSHIRE.—The foundation-stones of this building were laid on the 2nd inst. The building is late Gothic in style, the dressing being of terra-cotta, and facings of red brick. The present contract is for the church, church parlour, and vestries only (complete without the upper portion of tower). Provision is made for a large future school. The contract is let to Messrs. Bastiman Bros., Middlesbrough, the amount being 3,234*l.* The architects are Messrs. George Baines & Son, Clement's-inn, Strand, London.

ORGAN AND VESTRIES, CHRIST CHURCH, PENGE.—The new organ and the vestries which have been added to the building of Christ Church, Penge, were dedicated recently by the Lord Bishop of Rochester (the Right Rev. Dr. Harmer). The organ—built by Messrs. Brindley & Foster, of Sheffield, London, and Glasgow, and designed by them in collaboration with Mr. William Darley, the organist and choirmaster of the church—has been erected at a cost of about 1,000*l.* The vestries have cost about 600*l.* The architect was Mr. Bassett Smith, and the builders Messrs. Potter, of Croydon.

WESLEYAN CHAPEL, BRADFORD.—On the 15th ult. the memorial stones were laid of a new chapel and school at Bradford. The chapel will front Legrams-lane, the school being situated in the rear, the principal entrances to the chapel being from Legrams-lane, and leading into a large vestibule, divided at each end from the inner halls and gallery staircases by ornamental screens and folding doors. The seating accommodation in the chapel will be for 286 persons—159 in the gallery, 111 in the children's gallery, and thirty in the choir, a total of 586 persons. There will be a rostrum and communion platform, with choir gallery and organ loft behind. In the school, which was opened about a month ago, there are two assembly halls, one for seniors and the other for juniors, each 52 ft. by 30 ft., and ten classrooms, two large ones for sewing meetings, etc. On special occasions the senior assembly hall can be enlarged, three of the classrooms having movable partitions. There is a kitchen and a gymnasium, and tearoom in the basement. The work is being carried out from the designs and under the superintendence of Mr. Abram Sharp, architect, Bradford, by the following contractors:—Masons, Messrs. A. Broxup & Son, Bradford; joiner, Mr. I. Taylor, Lees, Keighley; plumber, Mr. J. Dyson, Baildon; plasterers, Messrs. J. & W. Bates, Bradford; slater, Mr. J. Smithies, Bradford; painter, Mr. J. C. Calvert, Bradford; ironfounders, Messrs. A. Pulman & Sons, Halifax; and heating apparatus, Mr. J. Anderson, Bradford.

UNITED METHODIST CHAPEL, CRIMPLESHAM.—This building has been erected in the Coldham-road, Crimplesham. The new hall is of red brick, relieved with white moulded brick. It is entered by a porch, which projects beyond the face of the main building, and from the porch two passages lead to the main hall. The hall is 33 ft. 6 in. long and 24 ft. wide. Beyond the main hall is a retiring-room, which can be divided by means of folding partitions into two rooms. The floors are of maple wood laid on cement concrete; the heating is by means of radiators, and the ventilation is arranged in the roof with exhaust ventilators. Messrs. W. Jarvis & Son, of Lynn, are the architects, and Messrs. Tash, Langley, & Co., the builders.

SCHOOL, BRISTOL.—The Wick-road Council Schools have just been completed for the Bristol Education Committee. The buildings are situate in Wick-road, Brislington, about 200 yds. from main road to Bath. There are three separate departments—boys, girls and infants, each accommodating 360 scholars. These have been planned so as to allow of the addition of two classrooms to each department, which when carried out will make the total accommodation sufficient for 1,380 scholars. In each department there is a central hall, from which all the classrooms are entered. The buildings are of red pennant stone with Monks' Park stone dressings, and the roofs are covered with Welsh green slates. The heating scheme is by Mr. W. Jones, of Stourbridge, the system adopted being low-pressure hot water. The contractors for the various works were:—Building, Mr. T. R. Lewis, Bishopston; heating, Messrs. Skinnner, Board & Co., Rupert-street; plumbing, Mr. G. F. Tuckey, St. Paul's; tar-paving, Mr. G. Melsom, Victoria-road, St. Philip's. The total cost of the buildings has been 12,377*l.* The architects' estimate was 12,940*l.* Mr. H. Prigg acted as clerk of works, and the architects were Messrs. Holbrow & Oaten, Bristol.

SCHOOL, DUNDEE.—The Ancrum-road Public School, Dundee, has been reconstructed. The additions are designed upon the central hall principle, there being two large central halls, one on each floor, giving access to the classrooms. For the first time in Dundee electric light will be introduced into the school, the old as well as the new portion being illuminated by that means. Heating and ventilating will be done by mechanical power. Accommodation will be given to over 1,400 children. The cost of the reconstruction will be over 8,000*l.* The architect is Mr. J. H. Langlands. The principal contractors for the work are:—Masons, Messrs. A. & T. Craig; joiner, John F. Shaw, Louden's-alley; and plumber, David Brown, Tay-street and Overgate.

NATIONAL SCHOOLS, HOWDEN-ON-OUSE.—Lieut.-Colonel Saltmarshe recently laid the foundation-stone of the new National Schools at Howden. The new schools, which are in the lower end of Pinfold-street, are of Gothic design, and will cost between 1,200*l.* and 1,500*l.* The chief room is 57 ft. long by 22 ft. wide, with two other rooms 24 ft. long by 20 ft. wide. There are outbuildings and accommodation for about 200 scholars. Mr. W. H. Blackburn, of Howden, is the architect.

SCHOOL, ST. GEORGE, BRISTOL.—On the 24th ult. the new Air Balloon Hill Council School, St. George, was publicly opened. The school is situated near the main Hanham road, and consists of three departments—boys', girls', and infants'—each department providing accommodation for 350 children. The buildings include a cookery centre, a manual instruction centre, and a caretaker's house. The cookery centre is placed over two of the classrooms, and the teachers' rooms are over the cloakrooms in each case, otherwise the rooms are on the ground-floor. Pennant stone is used, a small proportion of Bath Stone being used for dressings. Two entrances, with cloakroom adjoining, are provided for each department, and in each building is a central hall with large windows at both ends as well as side windows. The cookery room provides for eighteen students at practice, or fifty-four at demonstration. The manual instruction room provides for a class of twenty, and contains a master's desk, lockers for tools, and show-cases for patterns and finished work. The walls generally are plastered, the classrooms having high cement dadoes, and the floors are generally of wood blocks, the passages and cloakrooms having asphalted floors. The architects of the buildings are Messrs. La Trobe & Weston, of Bristol.

WEST JESMOND COUNCIL SCHOOLS.—The Mayoress of Newcastle on the 26th ult. opened the new Council schools in Forsyth-road, West Jesmond. The mixed junior department is in a separate building of one story, and the senior departments are located in a two-storied building, the girls on the ground-floor and the boys above. The teaching rooms are all placed with sunny aspects, the cloak-rooms face north, and the playgrounds are open to the south. The ventilation is by means of fresh air inlets in the walls and extractors in the roofs. The contract price for the senior and junior school was 11,460*l.* Mr. E. T. George was the general contractor, and the whole of the buildings have been erected from the designs and under the superintendence of Mr. Charles S. Errington, of Newcastle.

SCHOOL, NEWCRAIGHALL.—Offers by contractors for the erection of the new school at Newcraighall were under consideration at a meeting of Inveresk School Board on the 26th ult. The total estimated cost is 3,750*l.*, and it is anticipated that the school will accommodate 420 scholars. The cost works out at about 8*l.* 9s. per head. The architect is Mr. A. Murray Hardie, Edinburgh.

ETON COLLEGE WAR MEMORIAL.—On the 29th ult. Prince Alexander of Teck laid the foundation-stone of the buildings which are being erected at Eton College in memory of the old Etonians who fell in South Africa. The buildings will consist of a new school hall, large enough to hold the whole school, 140 ft. long, 55 ft. wide, and 45 ft. high; a domed octagonal library, about 55 ft. in diameter—both facing the college—and a classical museum. The whole will be in the Renaissance style, of Portland stone and red brick, the architects being Messrs. L. K. Hall & S. K. Greenslade.

LABORATORY, OSWESTRY GRAMMAR SCHOOL.—The foundation-stone has just been laid at Oswestry Grammar School grounds of the new laboratory. The building was designed by the architect, Mr. W. H. Spaull, and is in course of construction by Messrs. Jones & Evans, of Oswestry. It consists of a lecture-room capable of accommodating forty pupils, and a laboratory large enough to occupy thirty-six in practical work at a lesson, besides store-room, dark-room, balance-room, and basement for heating apparatus.

FIRE BRIGADE STATION, SWANSEA.—The new Swansea Fire Brigade Station has been erected on a site between Alexandra-road and High-street, with frontages in Pleasant and Orchard streets. The accommodation of the new station includes—On the ground floor—engine-room, hose tower, stables, shed for fire escape, eight cells, lavatories, etc.; on the first floor—dining, recreation, reading, sitting, bed, and bath rooms; and on the second floor more bedrooms. On the basement is a heating chamber. Mr. John Williams was the contractor, and Mr. Bell (the Borough Surveyor) the architect.

WORKMEN'S DWELLINGS, SOUTHWOLD.—New working men's dwellings have been erected at Southwold. The dwellings number sixteen. On the ground floor are a living-room, kitchen, and scullery, and on the first floor one large and two small bedrooms. Mr. Key, of Aldeburgh, the architect, and Mr. Wales the contractor.

WORKHOUSE BUILDINGS, ECCLESALL, SHEFFIELD.—The weekly meeting of the Ecclesall Bierlow Board of Guardians was held at the Union Offices, The Edge, on the 19th ult., when the Building Committee recommended that plans prepared by Mr. W. C. Fenton (Messrs. Hall & Fenton, architects, St. James's-row) for the provision of extra accommodation at the Workhouse, be adopted by the Board, and afterwards forwarded to the Local Government Board for approval. Mr. Fenton had intimated to the committee that the cost of the entire scheme to provide accommodation for 204 beds would be approximately 9,670*l.*; 6,110*l.* would be the approximate cost of a large block to accommodate 120 beds, and 3,560*l.* for a small block to accommodate eighty-four beds.

DISTRICT BATHS, BRADFORD.—On the 19th ult. two of the series of district baths which are in course of erection in various parts of the city of Bradford were opened to the public. The baths are to serve the township of Bowling, and are situate in Leeds-road and Wakefield-road. They have been erected from designs by the City Architect (Mr. F. E. P. Edwards). The main feature of the establishment is a swimming-bath, 60 ft. in length by 20 ft. wide, and constructed in a wide, light, and airy hall 74 ft. 6 in. in length by 33 ft. 9 in. About the bath are fifty-two dressing-boxes. Access is gained to this hall by a corridor from the front. A series of slipper baths and douche baths for men and another similar series with a separate entrance for women are also provided, and there are also separate waiting-rooms for men and women. The total cost of the land acquired for the bath was 1,123*l.*, and the cost of the building itself was 6,811*l.* The bath in Wakefield-road contains almost exactly the same accommodation as that in Leeds-road.

NAVAL TRAINING BARRACKS AT SHOTLEY.—About eighteen months ago Shotley was selected as the site for the naval training barracks, and shortly after that the Admiralty placed in the hands of Mr. Fred Bennett, of Ipswich, the contract for constructing it. The ground owned by the Government amounts to 65 acres, and slopes down to the confluence of the Orwell and Stour from tolerably high land. The whole scheme has been designed under the superintendence of the Director of Works of the Admiralty (Col. Raban, C.B., R.E.), and the civil engineer in charge of the work is Mr. T. C. Agutter. The lighting of the establishment, indoors and outdoors, will be by means of electricity, and a power-house has been erected and equipped, under the advice of Messrs. Preece & Cardew, consulting electrical engineers to the Admiralty. The generating station has been fitted up by the Westminster Engineering Company, under the supervision of Mr. Girdlestone, managing director of the firm, and the electric mains have been laid by Messrs. Callender, Limited, of London and Erith.

LANSDOWN-GROVE HOME, BATH.—At the Lansdown-grove Home, in connexion with the Bath Homœpathic Hospital, recently, the foundation-stone of an extension to the building was laid. This is at the western or Lansdown-road end of the institution, and will provide eight additional private wards, nurses'-room, kitchen

and dining-room, with servants' accommodation. It will be in the same style as the rest of the building. The architects are Messrs. Wilde & Fry, of Weston-super-Mare, and the contractors Messrs. Erwood & Morris. The cost is about 2,500*l.*

BURLEY-IN-WHARFEDALE COUNCIL'S NEW OFFICES.—The new council offices at Burley-in-Wharfedale were opened on Saturday last week by Sir F. W. Fison, Bart., M.P. A house known as "The Grange" has been altered and made into offices and committee-rooms under the superintendence of Mr. H. S. Chorley (the hon. architect).

PREMISES, ALBEMARLE-STREET, PICCADILLY.—The site of St. George's Chapel, lately pulled down, has been taken for the erection of premises after plans and designs by Messrs. Gale, Durlacher, & Emmett.

SANITARY AND ENGINEERING NEWS.

PROMENADE, BLACKPOOL.—The new promenade at Blackpool, by means of which 22 acres have been reclaimed from the shore, has just been opened. The sea defence works and new marine promenades comprise two extensive sections of municipal coast defence and promenade construction enterprise, and have cost together nearly 450,000*l.* The north shore works and promenade were commenced in August, 1895, and completed in July, 1900, at an outlay of 150,000*l.* They cover about 10 acres, and comprise an easterly footway, carriage-drive and tramway, westerly footway, broad middle walk (50 ft. wide), and a lower footway 24 ft. above the level of the seashore. The central and southern sea defence works and promenades were commenced in May, 1902, and completed as far as the North Pier in June, the amount expended being 300,000*l.* The area reclaimed from the seashore is 22 acres, while the entire works cover 35½ acres. The concrete and sand-filling, in the sea-wall and surface works, occupy 610,000 cubic yds., and 278,000 tons of cement gravel and shingle have been utilised. Between the sea and the buildings fronting are a footway on the land side, 15 ft. to 30 ft. wide; a new carriage-drive, 40 ft. wide; an island footway, 10 ft. wide; and a tramway track, 17 ft. 6 in. to 20 ft. 6 in. The average width of the broad westerly footway or parade is 80 ft. There are also thirty-five flights of steps 15 ft. wide, and six roadways 30 ft. wide leading to the sands. Mr. J. Wolstenholme, the then Corporation Surveyor, was responsible for the North Shore undertaking, and Mr. J. S. Brodie, the present surveyor, for the remainder.

PROPOSED BRIDGE, MONYMUSK, N.B.—Four designs have been prepared by Messrs. Walker & Duncan, C.E., of Aberdeen, for a new bridge which it is proposed to erect over the River Don near Monymusk. The estimates of cost vary from over 4,000*l.* down to 3,000*l.*

SEWERAGE WORKS, ELY, WALES.—The foundation-stone of the new pumping-station at Ely in connexion with the sewerage works which are being carried out by the Llandaff and Dinas Powis District Council was recently laid. Mr. Baldwin Latham is the engineer to the Council, Mr. A. Starr engineer to the contractors, and Mr. S. Southey resident engineer.

FOREIGN.

SOUTH AFRICA.—The foundation-stone of the municipal power-house was recently laid at Port Elizabeth by the Mayor. The contractors are Messrs. Wills & Davey.——Mr. Mario da Veiga, a well-known local architect, has received a commission to draw up plans for the erection of a new theatre at Lourenco Marques (Delagoa Bay).——At a meeting of the Johannesburg Master Builders' Association the chairman stated that the Association was quite ready to meet the men on the subject of compensation for and insurance against accidents.——The Cape Government invites architects residing in and practising in South Africa to compete in the design for a building to be erected in Cape Town for the accommodation of a Supreme Court of the Colony. Premiums of 500*l.*, 300*l.* and 200*l.* respectively will be awarded to the authors of the designs adjudged to be first, second, and third in order of merit.——At Livingstone, Rhodesia, contracts have been let for the erection of the first group of Government buildings on the site of the new township, Mr. Dark being the successful tenderer.——Messrs. McDonald & Thorpe, of Pretoria, have secured the contract for the erection of the new gaol at Pietersburg, their tender being 10,853*l.* The work is being carried out under the supervision of Mr. J. C. Edwards, of the P.W.D., and has to be completed within six months.

GERMANY.—The new hospital at Bayreuth, designed by the architect, Herr Schlee, was opened on May 6; the building cost 700,000 marks.——The new Church of St. Matthias, at Frankfort, designed by Professor Pützer, was consecrated on May 21.——The foundation-stone of the church at Karlsruhe, designed by the architects, Curjel and Moser, was laid on May 31.

AUSTRIA.—The new French Embassy at Vienna is being built under the direction of the French architect, M. Chédanne; the building will cost two million francs.

MISCELLANEOUS.

ST. MARGARET'S CHURCH, WESTMINSTER.—On July 10 a faculty was granted for, with other things, the lengthening eastwards of the chancel by about 6 ft., the releading of the east window and its replacement 4 ft. higher in the wall as rebuilt, and the removal of the reredos, the central panel excepted, for a new reredos to embody the central panel. The Crown have conveyed the land in fee-simple to the rector for the extension of the chancel at the price of 50*l.* The east end of the church was reconstructed by S. P. Cockerell, who restored the fabric and the interior in 1798-9. The relievo of the supper at Emmaus, in the middle of the reredos, was carved in limewood in 1753 by Seffrin Alken, of Soho it is copied from Titian's picture in the Louvre, the figures being portraits of King Ferdinand V., his grandson Charles V., and Cardinal Ximenes. The five-light east window of the Crucifixion was, it is said, executed at Gouda, in Holland, and given by the Synod of Dort to Henry VII. By another account it was made for Ferdinand and Isabella in honour of their daughter Katharine's betrothal to Arthur Prince of Wales; it contains supposed portraits of the Prince and his bride. The window has seen many vicissitudes. Henry VIII. gave it to Waltham Abbey, whence at the Dissolution it was removed to New Hall, Essex, and having passed to various owners, including Oliver Cromwell, the two Dukes of Buckingham (Villiers), and General Monk, at New Hall, was sold by John Conyers, of Copt Hall, Essex, to the parishioners for 420*l.*, part of a sum voted in 1758 by the House of Commons for rebuilding the chancel of their church. The new work will be entrusted to Mr. C. E. Kempe.

LONDON BUILDING ACTS (AMENDMENT).—In the House of Commons, on the motion for the third reading of the London Building Acts (Amendment) Bill, Sir A. Rollit said that the Bill caused his constituents, who were some of the smallest and largest tradesmen in Islington, much concern, because they felt that their interests would be affected by the too drastic methods employed in the Bill for the purpose of preventing the consequences of fire. Owing to the very strong feeling expressed by the London Chamber of Commerce, the Committee had made very material modifications in the measure, which modifications had gone far to remove the objectionable features. Those who promoted the Bill would recognise the duty of doing no more than was absolutely necessary for the protection of life and property. The substitution of the appeal tribunal to the London Building Act of 1894 was a distinct improvement in the Bill as it originally stood, and which referred the differences to arbitration. Considerable objection might still be felt to the prevention of appeal in the case of new buildings as not physically and entirely new, but technically new buildings, owing to the reconstruction of a large portion of them. In that instance the committee, after careful consideration, did not see their way to make those modifications asked for by the London County Council, but he was glad to see that the representative of the County Council in that House (Mr. Burns) had intimated his intention of seeking for opportunities in another place to have those objections met. He would be glad if the County Council in the meantime could give some indications that the objections to which he had referred would receive consideration, and, personally, he should be glad if some solution could be effected by amicable arrangement rather than resorting to the expensive and not always efficacious process of lodging a further petition and giving farther evidence in another place. He would not put the House to the trouble of a division, but would leave the matter in the hope that whatever was still regarded as objectionable in the Bill would be favourably considered, and that it would be unnecessary to resort to an appeal to another place.—The Bill was then read a third time.——The Hackney Borough Council at its last meeting adopted the following resolution:—"That as the London Building Act of 1894 is already complicated by the amendments of the Act of 1898, this committee is of opinion that a new Building Act for London—codifying the present laws with such amendments as may be deemed desirable therein—should be formulated, but before any such Bill is drafted, the whole question should be reported upon by a Royal Commission in order that the views of the London County Council, the Corporation of the City of London, the Council of the City of Westminster, and the several Metropolitan boroughs, also the various professional associations connected with building work, may be ascertained and considered."

BASEMENTS.—The Medical Officer of Health of Islington (Dr. A. E. Harris), in a report to the Borough Council, attributes the fact of 1,300 houses in Islington of the better class and high rentals being unoccupied, to increased transit facilities for living in the country, to the desire to dwell in flats, and to the servant difficulty of objection to basements. There is little doubt, he says, that if these empty houses had been built without basements, none, or very few, would be empty to-day. Living underground, in however slight a degree, is repugnant to persons imbued with the teachings of modern sanitation, and consequently people, especially educated folk, will not live in houses so built. A non-basement house in good condition is secured as soon as it is announced to be let.

ARCHITECTS AND MIDDLESEX COUNTY COUNCIL.—At the meeting of the Middlesex County Council on July 27, the Education Committee brought up the following report: "The County Council at its meeting on June 25, 1903, adopted a resolution in the following terms: 'That as regards new schools and other educational buildings, a limited number of architects be invited to send in competitive designs from time to time when new schools, etc., are required.' The Council are no doubt aware that with two exceptions only the plans for the new schools which the County Council has, since the 'appointed day' decided to erect, have been prepared by Mr. Crothall, the Committee's surveyor. Your Committee are of opinion that the time has now arrived when the foregoing resolution of the County Council should be rescinded, so that where it is thought desirable plans for new schools may be prepared by Mr. Crothall, and they therefore recommend that the resolution passed on June 25, 1903, be rescinded." The report and recommendation were adopted without discussion or dissent.

BRISTOL MASTER BUILDERS' ASSOCIATION.—The members of the Bristol Master Builders' Association had their summer excursion on the 25th ult. Oxford and Blenheim Palace were the places selected for visiting, and a train from Temple Meads conveyed a large party. When the University city was reached, breaks conveyed the party to Briol's Restaurant, which the Association made their headquarters. A round of visits to the colleges followed. Luncheon was held at Burt's Restaurant, Mr. E. L. Neale (President of the Association) presiding. After luncheon vehicles conveyed the party to Blenheim Palace, after which a return was made to Oxford, where dinner was partaken of. Mr. E. L. Neale presided. After dinner the loyal and other toasts were honoured, and the party then went to the railway station, and arrived in Bristol soon after ten o'clock.

NEW BUILDINGS, CHRIST'S COLLEGE, CAMBRIDGE.—A fund has been opened, and the subscriptions now amount to about 2,200*l.*, for commemorating in a permanent manner the four hundredth anniversary of the re-founding of God's House, as Christ's College, by the Lady Margaret, Countess of Richmond and Derby, in 1505. At a recent meeting of the Master and Fellows it was resolved, and the subscribers have adopted the suggestion, that the fund could be most fittingly applied to the erection, at an estimated cost of 3,500*l.*, of new buildings in the third, or further, court.

MEMORIAL TO SIR HUMPHRY DAVY AND MARIA EDGEWORTH.—The Clifton Improvement Association have prepared an inscribed tablet which they will affix upon the front of No. 3, Rodney-place, Clifton, a house which was the home of Sir Humphry Davy in 1798-1801, of Dr. Thomas Beddoes, and of Maria Edgeworth.

EXHIBITION AT FLORENCE.—A syndicate of members of the fine art academies in Italy have undertaken to open, on December 1, in Florence an exhibition of modern Italian art.

CHEAP COTTAGES EXHIBITION.—In the Parliamentary papers published on the 28th ult. appears a question by Mr. Noel Buxton, who asked the President of the Local Government Board whether, in view of the favourable opinion held by competent authorities of the cheap cottages now being exhibited at the Garden City at Letchworth, he would take into consideration the question of further modifying the model by-laws issued for the guidance of district councils. The reply of Mr. Gerald Balfour is that it is desirable, in the first instance, that an officer of his department should visit the exhibition and report on the subject. Arrangements were being made for this purpose.

EXTENSION OF ELECTRICITY PLANT, HULL.—The Hull Electric Lighting Committee, at their meeting, held on the 27th ult., adopted the recommendation for the substitution of the old high tension switchboard by one of more efficient design. The engineer reported that a new Ferranti switchboard, of a similar size to the old board, would cost 6,400*l.* In addition to this there would be the cost of a building in which to erect the same, which would amount to about 400*l.*, making a total of 6,800*l.* The sub-committee recommended that the City Engineer be instructed to prepare plans for and to proceed with the work of the buildings. The committee accepted the tender of the Oldham Boiler Company, Oldham, for six Lancashire boilers, at a

cost of 4,013*l.*, and that of the Lahmeyer Eectrical Company for high and low-tension steam dynamos the prices being—high tension, 4,066*l.* 3s.; low tension, 3,838*l.* 15s.

MEMORIAL OF ARCHBISHOP TEMPLE, CANTERBURY CATHEDRAL.—On the 29th ult., a bronze statue of the late Archbishop Temple, was unveiled by the Archbishop of Canterbury in Canterbury Cathedral. It is the work of Mr. F. W. Pomeroy.

PUBLIC HEALTH AND HOUSING ADMINISTRATION.—A deputation, representing several housing associations, was received by the President of the Local Government Board at the House of Commons on Thursday last week. Mr. Hay, having introduced the deputation, Alderman Thompson said he had been asked specially to draw Mr. Balfour's attention to the great need for securing a fuller use and better administration by local authorities of their existing powers under the Public Health Act and the Housing Acts. He was also asked to say that it would be most helpful to the cause of housing reform if a circular were sent to all local authorities, not only stating their powers under the various Housing Acts, but urging them to make a fuller use of many of them. It was unquestionable that many towns with a terribly high death-rate neglected their duties in regard to the systematic inspection of their areas and the gradual improvement of them. The Housing Committee of the Corporation of Liverpool had recently made a house-to-house inspection, and had discovered that over 9,000 houses were structurally insanitary. Between 1898 and 1902 the Corporation of Hull "represented," under Part 2 of the Housing Acts, 1,425 houses in about fifty different streets as unfit for human habitation, and 362 of these houses were demolished. Liverpool and Hull, however, stood almost alone in this respect. In the great majority of cases the inspection simply meant a few cursory and unsystematic visits to certain dwellings. In hardly any case did the councils possess accurate and full knowledge of the extent to which remedial action was needed.—Mr. Gerald Balfour, in replying, agreed as to the desirability of securing more active administration of the health and housing powers of local authorities, but desired to point out to the deputation that it was not so easy as they imagined for the central body to put pressure on the local authorities. He promised to consider how far fuller and more systematic action could be taken on the reports of medical officers. He could not, however, promise the very full methods of inquiry suggested, as the staff was already hardly sufficient. Moreover, a good deal of work was done in this direction now. In the meantime, if the National Housing Reform Council sent him particulars as to cases of slum areas or large numbers of unhealthy dwellings neglected by the local authorities, he might promise that these particular cases should have attention.—The desirability of framing new by-laws to secure better planning of new housing areas was then dealt with by Mr. Aldridge, who pointed out that many of the worst slum areas need clearance not so much on account of the dilapidation of the houses as because of the hopelessly bad planning permitted in the past by municipal authorities. The present model by-laws had remedied the worst features of this overcrowding of houses on sites, but the standard was still far too low. Whilst recognising that the Local Government Board could only prescribe a general minimum, the deputation desired to ask the President of the Board whether an alternative model set of by-laws could not be prepared and issued, providing for greater width of streets, the setting back of cottages, and the provision of gardens in new suburban areas, and local authorities urged to adopt them. It was of great value that a minimum should be set, but there was no reason whatever why each council should look upon the model by-laws as unalterable. With encouragement from the Local Government Board, local authorities might be induced to plan garden suburbs like Bournville, and greatly reduce their death-rates by securing healthier conditions.—Mr. Balfour assured the deputation that any desire shown by the local authorities to improve upon their by-laws in the way suggested by the deputation in regard to the provision of wider roads and more open spaces would be cordially welcomed by the Local Government Board, though regard must of course be had to questions of reasonableness and cost.

Legal.

THE WIDENING OF PICCADILLY:
ACTION AGAINST THE WESTMINSTER CORPORATION.

THE hearing of the case of Pescod *v.* the Mayor, etc., of the City of Westminster, commenced before Mr. Justice Swinfen Eady, in the Chancery Division, on the 26th ult., an action by the plaintiff to restrain the defendants from proceeding with a notice to treat which they had given under the provisions of Michael Angelo Taylor's Act, and under which the defendants claimed the right to acquire compulsorily the interest of the plaintiff in No. 30, Piccadilly.

Mr. Macmorran, K.C., and Mr. Chubb appeared for the plaintiff, and Mr. Eve, K.C., and Mr. Methold for the defendants.

Mr. Chubb, in opening the case, said plaintiff's premises were about to be pulled down in connexion with the widening of Piccadilly. The objection which the plaintiff took to the defendants' proceeding under the notice was, shortly, that defendants had purported to use their powers under this Act for the purpose of enabling them to acquire not only that which they required for the widening of Piccadilly, viz., a 22-ft. strip of the plaintiff's premises, but to acquire the whole of the plaintiff's premises. The land really required by the defendants from the plaintiff was not more than one-fourth of the whole, but the defendants proposed to acquire the whole of plaintiff's interest in order that they might carry out a contract which they had previously entered into with a private company, under which that company was to pay the costs to acquire the whole upon condition of having surrendered to it the plaintiff's interest in the back portion. His submission was that for a public body to attempt to acquire property in the manner he had indicated was not a legitimate exercise of its powers and not a *bonâ-fide* attempt to carry out powers conferred upon it by Statute, and was a proceeding which ought not to be allowed. To his mind, this case was peculiar in two particulars. This, he believed, was the first time a public body had attempted to acquire land for other purposes than the widening of a roadway, viz., for disposal to a private company under an agreement and for the specific interests of certain persons. The second point under which the action was unique was that it was the first time a corporation before giving notice to treat entered into a contract to re-sell a portion of the land. He should contend that this agreement on the face of it was not a *bonâ-fide* exercise of the defendants' rights at all, because it was an unjust act to attempt to exercise the rights under the Act for the benefit and at the instance of someone else who had to give the defendants a large consideration for obtaining the benefit. As to the facts, he thought there was very little dispute. Plaintiff was a tailor, and had got together a good business, and it was essential he should remain in his present premises, inasmuch as there was no other shop he could get in Piccadilly. What the plaintiff said was, that he could carry on his business perfectly well if the defendants would leave him the rest of his premises after taking the 22-ft. strip they required. The scheme for the widening of Piccadilly was being carried out jointly between the London County Council and the defendants. The County Council had no powers compulsorily to acquire land at all, whereas the defendants had, and an agreement was arrived at between the defendants and the County Council that the defendants should put those powers into force. The work would be carried out by the County Council and the defendants would contribute towards the cost. Proceeding, the learned counsel said that his evidence would go to prove that his client could carry on his business on the premises that were left after the strip required for the widening had been acquired, and a surveyor and builder would tell his lordship that the front portion of the premises could be pulled down, leaving the plaintiff the back premises, a shop and house 20 ft. deep. Defendants said it was necessary for their workmen to use the back part of the premises for the demolition of the buildings, and that they would have to be taken down for the purposes of rebuilding.

In reply to his lordship, Mr. Chubb said that the plaintiff was willing to put up with a little inconvenience, even to a suspension of business for a fortnight, in order that he might retain the back premises. His point was that the defendants were only empowered to take the portion they required for street widening, and therefore they could only take the front portion.

His lordship: Do I take it that the only point in dispute is, that you say they are only empowered to take what they require, whilst defendants say they are empowered and it is necessary for them to take the whole for the widening in question?

Mr. Chubb said that was so.

Plaintiff was called and gave evidence in support of his case.

Mr. A. H. Turner, of Messrs. Alexander Turner & Co., surveyors, gave evidence, and said it was his opinion that the portion of the plaintiff's premises that would remain after the 22-ft. strip had been taken for the Piccadilly widening would be sufficient for him to carry on his business. He thought the front of the premises could be taken away without injury to the plaintiff continuing his business.

Mr. A. J. Bywater, of Messrs. Bywater & Sons, builders, of King-street, Regent-street, gave evidence that he saw no difficulty in pulling down 22 ft. in front of the plaintiff's premises and the plaintiff retaining his shop. In his opinion it was not necessary to take the whole of the plaintiff's premises for the pulling down of the front.

This was the plaintiff's case.

Mr. Eve, in opening the case on behalf of the defendants, said that nobody could suggest that the proposed improvement was not a great public improvement. He submitted that the defendants had the right to do what they sought to do, and there was nothing to lead the Court to come to the conclusion that the notice to take the whole of the premises in question was not *bonâ fide*. The learned counsel, having cited a number of cases in support of the defendants' case, said that the plaintiff's interest in the premises was comparatively small having regard to the whole area of the premises. The plaintiff's tenancy came to an end in two and three-quarter years' time, and to give him the relief he claimed would put the defendant authority in an extremely hard position. He thought that when his lordship had heard the evidence which would be tendered on behalf of the defendants that he would agree that to do as the plaintiff asked would put an unnecessary burden on the local authority. Upon that evidence he should ask his lordship to come to the conclusion that this was a case in which the defendants had acted with perfect good faith, and in order to carry out effectively the improvement contemplated it was necessary that they should have the opportunity of acquiring the whole of the premises in question. Unless the plaintiff was able to show that the resolutions arrived at between the Council and the Hotel Company were *mala fides* he was not entitled to the relief he asked for.

Mr. Andrew Young, valuer to the London County Council, examined, said he was the responsible officer to treat for the widening of Piccadilly. In his opinion it was impossible for the plaintiff to remain in possession of the back portion of his premises while the work of re-construction went on.

Mr. Howard Martin, a surveyor, said he had surveyed the property, and in his opinion it was not possible to take down the front of the plaintiff's premises without considerable interference with the property. In fact, it was not possible for the work to proceed whilst the plaintiff was in possession except at very great expense.

Mr. A. R. Stenning, surveyor, also gave evidence corroborating that of the two previous witnesses.

This was the defendants' case.

Mr. Methold and Mr. Macmorran then addressed his lordship on behalf of their respective clients.

At the conclusion of the arguments his lordship said he would give judgment one day next week.

Judgment was accordingly reserved.

CITY LIGHT AND AIR DISPUTE.

THE case of Woodman and Bailey *v.* Mathieson came before Mr. Justice Buckley in the Chancery Division on the 31st ult.—an action by the plaintiffs to restrain the defendant from building in such a manner as to interfere with the light enjoyed by the plaintiffs in their premises, No. 43, London-wall, as the same had been enjoyed hitherto.

Mr. Buckmaster, K.C., and Mr. Geo. Lawrence appeared for the plaintiffs, and Mr. Astbury, K.C., and Mr. Martelli for the defendant.

Mr. Buckmaster, in opening the case, said the plaintiffs were Sir George Woodman and Mr. Thos. Bailey. Sir George Woodman was the lessee of the whole premises for a period of eighty years, from December 25, 1879, at a rental of 420*l.* per annum. The lease was granted to him under an agreement that he would rebuild the premises, which he did, and those were the premises that now stood. The plaintiff, Mr. Bailey, was the sub-lessee of the ground floor and basement for thirty-five years from June, 1899, under an agreement terminable at seven, fourteen, or twenty-one years, at a rental of 520*l.* per annum. He used this portion of the premises for the business of a tailor and cutter, and it was very important for the purpose of carrying out his business that he should have the light which the premises had enjoyed for twenty years past. Part of the premises ran over the Black Swan-alley, and it was the windows in the rear that they complained of. The defendant had not yet erected his premises, but it was in respect of the southern end of that proposed building that the main contest in the action arose. The old buildings stood at a height of 36 ft. Defendant now proposed to increase the height of the building to 54 ft., an increase of 18 ft. on the old building. Plaintiffs' light was received by means of reflectors from a wall and his lordship would see that the proposed raising of the defendant's building would interfere with the plaintiffs' light. Although there would be a substantial diminution of light to the first floor of plaintiffs' premises it was the ground floor that would be affected most.

After inspecting a model, his lordship asked if it was disputed that the defendant's new building would interfere with the plaintiffs' light?

Mr. Astbury pointed out to his lordship that

as a matter of fact defendant proposed to raise his building 8 ft., then go straight back 8 ft., and then rise another 10 ft. In that way they did not think the tower of their new building would in any way depreciate plaintiffs' light.

Mr. Buckmaster disagreed with that view.

His lordship thought it would take a great deal to persuade him that this additional 8 ft. would not interfere with the plaintiffs' light. It was quite obvious from the model what would happen. As far as he could see the only thing was to decline the line of the defendant's building.

Mr. Astbury said he was assured by Mr. Gruning that their new building would not interfere with the plaintiffs' light.

At this stage a consultation took place between counsel, at the conclusion of which Mr. Buckmaster stated he had consented to judgment for his client on the terms that the defendant's new building was sloped at the south as indicated by his lordship, defendant's tower to stand intact, and defendant to pay the plaintiffs 200*l.* and the costs of the action.

Mr. Astbury said that this was too much. The defendant would not consent to pay the 200*l.*

Eventually the parties agreed to take his lordship's judgment on the matter.

His lordship said he would reduce the damages to 100*l.*, defendant to pay the taxed costs of the action, and to slope the building as he had indicated. Defendant's tower was to stand intact.

ACTION BY ASPHALTER AGAINST BUILDERS.

THE case of Langston *v.* Lawrence & Sons came before the Court of Appeal, consisting of the Master of the Rolls and Lords Justices Romer and Mathew, on the 26th ult., on the application of the defendants, Messrs. Lawrence & Sons, a firm of builders, for judgment or new trial on appeal from verdict and judgment at trial before Mr. Justice Phillimore and a common jury in the King's Bench Division.

Mr. McCall, K.C., and Mr. Crawford appeared for the appellants, and Mr. S. T. Evans, K.C., and Mr. Ladde for the respondent.

Mr. McCall, in opening the case, said the action was brought by the plaintiff against the defendants for damages for personal injuries alleged to be due to the negligence of the defendants, first in allowing or causing a steel joist to fall on the plaintiff, and secondly in allowing certain scaffolding to be in such a condition that the steel joist did fall on the plaintiff. The case arose in this way: The plaintiff was an asphalte worker employed by Claridge's Patent Asphalte Company, Limited, and the defendants were builders, who, in August, 1903, had entered into a contract with Messrs. Robinson & Co. to rebuild certain premises in Regent-street at the corner of Beak-street. By the terms of the contract Messrs. Lawrence & Sons were to employ the co-defendants, the Asphalte Company, to do certain asphalte work, and Stewart's Granolithic Company, to do certain stone work. The contract was dated August, 1903. By July, 1904, the work had progressed beyond the fourth story, and on July 11, 1904, the accident in question happened. The case put forward for the plaintiff was that the scaffolding under which he was working was practically uncovered, and that there were very few boards across the putlogs which constituted the cross pieces of the scaffolding. The case of the builders was that the scaffolding on the morning of July 11 was, and had always been, closely boarded, and that upon the morning of the 11th, immediately before the accident happened, one of the boards was taken up by one of the men who was doing the stone work, and that that was the cause of the accident. That was the only issue which remained to be dealt with, then, because the jury at the trial found that the defendants were entitled to succeed upon the first issue of negligence and that they were guilty on the second. The first question left to the jury was: Did Messrs. Lawrence & Sons' men cause the steel joist to fall, and the answer to that was in the negative. The second question was: Was the scaffolding so insufficiently boarded as to let the steel joist through, and the answer to that was in the affirmative. The steel joist, which was on the scaffolding, fell down and struck the plaintiff, who was at work in a hole below. The plaintiff's case was that the scaffolding had been for weeks before, and was on the morning of July 11, in such an unsafe condition to the knowledge of the defendants as to allow the joist to fall through. Messrs. Lawrence & Sons' case was that the scaffolding had been carefully boarded, and was perfectly safe up to a few minutes before the accident happened, and that the accident happened owing to the wrongful removal of one of the boards by Stewart's men. He (counsel) submitted that the jury had been misled by a model used on behalf of the plaintiff, and which showed the scaffolding in such a condition that an accident was almost certain to happen. A second thing which he thought had misled the jury was a reference to the fact that the defendants were insured, and that the real defendants were not the builders, but an insurance company. A third thing which affected the jury was the putting in of a report, and this report could not have been admitted as evidence if the Asphalte Company had not been joined as co-defendants (the Company recovered judgment at the trial); and if the learned judge had stopped the case against the Company. The learned counsel contended that the verdict was against the weight of the evidence, and that the amount of the damages which the jury awarded, viz., 625*l.*, was, having regard to the medical evidence given, grossly excessive.

Mr. Crawford having followed on the same side,

The Master of the Rolls, without calling upon counsel for the respondent, in giving judgment, after stating the facts, said that the learned judge at the trial left certain questions to the jury, and the result of the verdict was that the Asphalte Company were exonerated from liability for the condition of the scaffolding. The learned judge then left certain questions to the jury in order to ascertain whether Messrs. Lawrence & Sons were answerable, and the jury answered the questions in such a way as to make Messrs. Lawrence & Sons responsible. It was not suggested that there was any misdirection on the part of the learned judge, but the contention on behalf of the appellants was that the verdict was against the weight of the evidence. He (the Master of the Rolls) was of opinion that there was evidence, reasonable evidence, called on the part of the plaintiff that on the day in question when the accident happened, there was a gap in the scaffolding so large as to admit of the steel joist falling through it for which the person responsible for the scaffolding was answerable. He saw no adequate reason to disagree with the verdict that the jury had found on the question of negligence, nor did he think that the assessment of damages by the jury was so grossly extravagant that this court ought to interfere. In these circumstances he thought the appeal should be dismissed with costs.

The Lords Justices concurred.

ACTION AGAINST THE LONDON COUNTY COUNCIL.

THE case of Lavers *v.* the London County Council came before Mr. Justice Kekewich in the Chancery Division on the 28th ult., on a motion by A. H. Lavers and A. H. Lavers, Ltd., who were respectively the freeholder and lessees of property in Nine Elms-lane, Battersea, for an interim injunction to restrain the defendants until the trial of the action or further order from taking further proceedings to assess the amount of compensation payable to the plaintiffs under a notice to treat dated May 6, 1901, with regard to obtaining possession of part only of the property. The facts were as follows: By the London County Council (Improvements) Act, 1900, defendants were empowered to extend the Thames Embankment and also to make certain street improvements, including the widening of Nine Elms-lane. Mr. A. H. Lavers was the freeholder of property in Nine Elms-lane known as Lavers' Wharf, the Company being the leaseholders of the wharf for the residue of a term of twenty-one years from December 25, 1898, at an annual rental of 750*l.* The County Council served both Mr. Lavers and the Company with notice to treat in respect of so much of the property as was required for the widening of the lane. In November, 1901, Mr. Lavers, as the freeholder, sent in a claim for 6,000*l.*, and the same month the Company, as leaseholders of the premises, sent in a claim for 14,430*l.*, and there was a stipulation in both claims that the rent, in respect of the premises comprised in the notice to treat, was to be apportioned at 200*l.* per annum. The London County Council, having raised an objection to this apportionment in March, 1904, served the plaintiffs with a summons, requiring them to appear before a stipendiary so as to have the question of apportionment determined. Subsequently this summons was abandoned on the plaintiffs agreeing to an apportionment of rent at 100*l.* Afterwards negotiations between the parties as to the price to be paid for the property having fallen through, the plaintiffs served the County Council with notice calling upon them to take the whole of the property under section 92 of the Lands Clauses Act, 1845. The County Council then took steps for the summoning of a special jury to assess the compensation to be paid to the plaintiffs in respect of the property comprised in the notice to treat of May, 1901. The plaintiffs then commenced the present action. The County Council, while admitting that they were not authorised by their special Act to take a part only of the property, alleged that the plaintiffs by acquiescence and delay were debarred from compelling the Council to take the whole of the property in question under section 92 of the Lands Clauses Act, 1845. The question for decision, therefore, was whether what had occurred prevented the plaintiffs from insisting on their rights under section 92 of the Act.

At the conclusion of the arguments of counsel his lordship held that the plaintiffs had done nothing to forfeit their rights under section 92 of the Act of 1845, and granted the injunction as asked.

Mr. Stewart Smith, K.C., and Mr. George Lawrence appeared in support of the motion; and Mr. P. Ogden Lawrence, K.C., Mr. Methold, and Mr. Morten for the London County Council.

VENTILATION OF BACK-TO-BACK HOUSES.

AT Coventry, on the 27th ult., the Town Clerk (Mr. G. Sutton) appeared in support of an information taken out at the instance of Dr. Hugh E. Snell, the Medical Officer of Health, against Richard Thorneloe, Stanton-street, for an alleged breach of the Housing of the Working Classes Act. Mr. Masser appeared for the defendant.

The Town Clerk said the case was brought in respect of a house in No. 1 Court, Thomas-street. This was said to be unfit for habitation, and a closing order was asked for. There were several alleged defects, but the principal ones were that there was no through ventilation and no wash-house accommodation. Something had been done to provide ventilation. The house was a back-to-back one, and Thorneloe had put in the front wall downstairs an iron ventilating pipe, with a "hit or miss" grating, which was connected by a metal tube with a grating on the other side of the wall, and thence through into the other house. This was, he believed, said by the defendant to provide through ventilation. The authority replied that such means were altogether inadequate, and that, if this kind of ventilation was to be allowed in Coventry, it would put an end to proceedings by the Corporation to get these back-to-back houses ventilated and fit for habitation. The defendant was owner of the other house, and he (the Town Clerk) suggested that the two houses should be made into one.

Dr. Snell described the system of ventilation which had been attempted in the downstairs portion of the premises, and said it was insufficient. Cross-examined, the Medical Officer said he had not for his object the turning of Coventry into a garden-city, but to make the houses habitable. He was opposed to back-to-back houses altogether—the death-rate in such houses was generally higher than elsewhere.

The Inspector of Nuisances (Mr. Clarke) did not think what had been done rendered the house habitable.

Mr. Masser sympathised with Dr. Snell's idea to make Coventry an ideal city, but submitted he had not made out a case that this house was unfit for habitation. Dr. Iliffe would tell the Bench that he considered the scheme adopted by defendant provided through ventilation, and, if requisite, defendant would provide a washhouse for the premises.

Mr. W. H. Hattrell, architect, considered that the air-shaft 10 in. in diameter that had been put through this house to the other one provided sufficient ventilation.

Dr. C. W. Iliffe said that there was a fireplace in the house, and he considered that the system of ventilation provided was, under the circumstances, satisfactory and efficient. Cross-examined, he admitted that there might be a slight improvement made, and that the inlet of cold air should be made to exceed the outlet.

The Bench, after retirement, announced that they had decided to visit the premises in question. —*Birmingham Post.*

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

14,993 of 1904.—S. H. ADAMS.: *Flushing and Discharge Siphons.*

This consists in the use of a siphon with an outlet above inlet level, said outlet having a slot below inlet level by means of which water escaping therefrom shall unseal a pipe or fitting, and allow air to enter to break siphonic action, an air-escape pipe in combination with an auxiliary water seal, into which it dips, and means for blowing out or removing the water from the latter, said siphon formed as a U-tray, with trap giving a deep seal, but not deep below the ground.

15,129 of 1904.—A. F. BURDH: *Cooling, Heating, and Similar Apparatus.*

Apparatus for cooling, heating, and the like, consisting in the combination with a metal sheet bent or folded upon itself in opposite directions, alternately or with separate sheets of distance pieces or frames, having inlet and outlet openings, and disposed between the successive folds of the sheet or between the separate sheets, and an enclosing casing having inlet and outlet openings extending across the side walls, so that each inlet and outlet opening communicates through the corresponding openings in the distance pieces with one series of chambers only.

17,175 of 1904.—J. A. CROSS: *Glass Houses, or Structures for Propagating and Forcing Seeds, Plants, Bulbs, and the like.*

This relates to glass houses or structures for

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

propagating seeds, plants, bulbs, or the like, consisting of a frame made with longitudinal ground rails arranged in pairs, of cross rails, and removable pins or stacks so arranged as to join the cross rails and longitudinal rails together, uprights supported midway between the longitudinal ground rails, and horizontal ridge pieces or rafters supported in grooves in the said uprights but adjustable to any suitable height from the ground, grooves or abutments on the ground rails to form rests, and glass panes resting at one end against these abutments, and at the other at opposite sides of the ridge pieces, in combination with pins or ridge pieces, so arranged to press against the glass and hold it in place.

18,494 of 1904.—H. L. DOULTON: *Means for the Support of Trough Water-closets.*

This invention relates to closets fixed in ranges, and is intended to provide means for supporting same by brackets fastened to a wall in order that the floor beneath the closet may be left as clear as possible. Any usual trough closet may be employed, but it is preferable to adopt those formed by a series of pans discharging into a common pipe, which is periodically cleaned by siphonic action. Such pipe is quite or nearly horizontal, and at suitable intervals along its length is fitted with a bracket, which extends to a wall with which it engages, either by being screwed or otherwise attached, or by being built in. The brackets are of sufficient strength to support the closets, and may be in one piece with the pipe or separate. In the case of an open or continuous trough closet the brackets are attached to the troughs in the same manner as to the pipe described.

19,329 of 1904.—G. JENNINGS and J. MORLEY: *Urinals and the like and the Manner of Fixing the same.*

This invention relates to the method of fixing urinals and like basins to walls or slabs. For this purpose the back, which is dished as usual, has two lugs, one on each side. Each of these lugs extends upwards, from the flange of the back, being formed in one piece with it and the back, thus giving great strength to the lug. The surface of the lugs is flush with the edge of the flange, so that when the urinal is placed against a wall or slab the flanges bear against it. Pockets are formed in the underside of the lugs to receive hooks fixed to the wall, and in order that the strain shall come on the strongest part of the lugs, the hooks are bevelled, being thickest at their tops. The hooks have screw stems, which engage with nuts let into the wall or slab, and secured with lead.

19,330 of 1904.—G. JENNINGS and J. MORLEY: *Pails or Receptacles Suitable for Night Soil and the like.*

The pails forming the subject of this invention are tightly closed and readily stacked. The upper edge of the body of the pail is formed perfectly level, and has fixed round it a number of inclines, with slots or spaces between them. The inner face of the lid is made truly plane to form a tight joint when pressed down upon the top of the body, and the flange of the lid has inside it lugs which pass through the slots or spaces, and engage with the inclines when the lid is turned, thus forming a bayonet joint. The top of the lid has a pair of rods or handles projecting from it, whereby the lid can be turned. The bottom of the body is raised above the lower edge of the sides, leaving a space beneath it, so that when one pail is put upon another the handles of the lower pail are received into the space beneath the bottom of the upper pail, and fitting against the inside of the projecting portion of the sides of the upper pail, centre the latter and prevent it from being moved sideways.

21,943 of 1904.—N. L. LOCKE: *Slip Bolt for Doors and the like.*

This invention relates to locking bolts for doors, and, according to the invention, the bolt is made in two parts, which are fitted together within a box or casing formed on or secured to the back of a face-plate screwed or otherwise fastened to the door. A loose thumb-piece and spring moving in a recess in one end of the part (the action of which is to retain or lock the bolt either in its shot or drawn position), is contained within the said box or casing. The thumb piece may be of various forms or shapes. In one convenient form it is ⊥-shaped, having at its lower ends raised parts, which extend upwards, the said parts entering into a recess in the upper part of the box. In shooting or withdrawing the bolt pressure on the thumb-piece releases the forward end from the recess, and moves the bolt forward, until the rear end of the thumb-piece is, by the action of the spring, forced into the recesses, thereby locking the bolt in position.

25,312 of 1904.—J. RULE: *Slabs for Treads, Risers and Return Ends of Steps or the like.*

Slabs for treads, risers and return ends of steps or the like, made of marble, concrete, or other suitable material, and provided with patterns in mosaic work, said slabs being suitably shaped to fit against or bear upon each other, and placed on or against new cores or bevelled old steps serving as cores.

25,763 of 1904.—J. G. REED and A. E. REED: *Window Opening and Closing Apparatus.*

This relates to a device whereby the ordinary method of weights and cords may be abolished. It is intended to suspend sashes, frames, or panels by a pliable closing and opening arrangement, which is actuated by force of cramping springs. This is effected by graduating pressure upon the running edges of the sash, frame, or panel, and is caused by the increasing force upon the springs, as the movable object descends lower in its runners. This device can be made in wood, iron, or other material. The idea is that the sliding sash or other object shall be sustained from falling, and assisted in the raising by reason of the resisting upward pressure produced by the springs endeavouring to regain their normal size, which can only be partly attained in the larger space of the wedge-like aperture at the top.

418 of 1905.—J. BANBURY (A. J. PARK): *Window Sashes, and the like.*

This invention relates to window sashes, and the like, and to the method in which the sashes are suspended. It consists in the combination with upper and lower window sashes of a single line for moving each sash independently, or both sashes simultaneously in opposite directions, a detent pivoted at one end, and provided with an orifice, through which the line is passed, pulleys being provided on the upper face of the top of the frame, and side pulleys situated in a groove in the top of the sash.

1,773 of 1905.—J. MONKS: *Lead Clips for Roofing and Glazing.*

According to the invention a lead strip is provided, holding at its base lead ears, a movable lead nib shaped so that weights such as snow, will not turn it back, and a brass nut and bolt to form a swivel for said lead nib. When being fixed the lead strip is nailed to the slate lath, and the movable lead nib is turned back, which allows slate or glass to be put in. The movable lead nib is then turned to its original position.

19,217 of 1904.—J. W. METCALF: *Device for Detecting Unauthorised Use of Hydrants and Other Valves or Cocks.*

A device for detecting unauthorised use of hydrants and other valves or cocks, said device comprising an attachment made fast to the spindle and adapted to be sealed by wax or other substance to a fixed plate or other stationary part, either directly or indirectly, so that when once sealed the spindle cannot be actuated without breaking the seal.

19,306 of 1904.—W. BERRYMAN: *Pipe Coupling.*

A pipe coupling admitting of rotation of one of the coupled parts without similar movement of the other, in which one of the parts to be coupled is secured in a ferrule screwed into a coupling sleeve while the other part is secured in a pipe free to rotate within the sleeve, the joint being effected by means of a stuffing box and gland at one end of the sleeve, and the two coupled parts being yieldingly held against a longitudinal extension by means of a spring which is compressed between abutments on the sleeve and the pipe respectively.

20,315A of 1904.—S. H. ADAMS: *Penstocks and Sluices.*

According to the invention, the door is slung or suspended from the worm or screw which raises it, and for this purpose two racks are formed upon the door, one on either side of the worm—*i.e.*, the worm works between two racks—the result being that the door hangs free from the penstock body. Further, it is preferably arranged that the spindle which carries the worm or screw shall be held in bearings at a greater height upon the frame. By this means greater play to the door is given, which enables it to swing into the position in which it works most freely. It is preferable to use a worm of larger size also, and such wedges, levers, screws, and fittings are used as is necessary. The penstock door when closed is usually held fast to the penstock body by means of wedges upon the frame in which it slides.

2,470 of 1905.—A. K. SEBESTÉNY and R. PÓKA: *Method of Making Walls, Pipes, and the like.*

This relates to a method of making walls, pipes, channels, and the like of ferro-concrete, according to which scaffolding columns or uprights, ribs or frames of ferro-concrete are erected at suitable distances apart and formed to correspond to the actual object of construction, such frames or the like being previously finished and perforated in the longitudinal direction of the object of construction, to which frames the scaffolding is fixed and the cross connexions of which serve as supports for the horizontal iron insertions of the object of construction, whilst, by a suitable arrangement of the iron framework, the perforations of the columns, ribs, or frames may be filled up with betor.

6,289 of 1905.—P. P. CHMELEFF: *Apparatus for Screening and Washing Sand and Gravel.*

This consists in the combination of a series of receptacles piled one above another, with one projecting over the rear end of the one below it, means for feeding material to the highest receptacle, an outlet for permitting material to pass from the front end of each receptacle to the receptacle below, and a series of troughs arranged below said receptacles, each adapted to receive material from the receptacle above and discharge it into the receptacle and trough below, and a screening in the rear end of each receptacle.

7,203 of 1905.—A. R. BENNETT and E. W. TWINING: *A System of Lining Railway and other Tubular Tunnels.*

A system for lining railway and other tubular tunnels built up of metal segments by means of hollow bricks moulded to fit the flanges and radius of such segments and to abut upon one another. The said hollow bricks being locked in position by means of locking bricks secured by means of wood, mortar, bitumen, or other suitable material.

7,384 of 1905.—S. MINGAZZI: *Scaffolding.*

According to the invention, the poles are constituted of two section bars, preferably of iron, connected together by means of crossbars, these latter being at such a distance one from another as to serve as rungs of a ladder and as supports for the hinge hooks of the brackets supporting the scaffolding; the crossbars are of angle iron and the ends are split and bent and riveted to the two bars of the pole. The pole or upright is constituted of several pieces of different length, according to requirement.

8,630 of 1905.—A. SWINNING and G. H. HEBBLETHWAITE: *Fire-resisting Door and Frame.*

A fire-resisting door, consisting in the combination of a series of porous and partially hollow blocks having grooves formed on their sides and edges, in combination with a frame capable of supporting said blocks so as to be partially enclosed thereby, and a layer of fire-resisting plaster for setting and covering the blocks, means for fitting the fireproof enclosure of an opening in a partition consisting in the use with said door of a casing formed of a series of partially hollow blocks either uncovered or enclosed by fire-resisting plaster, and means for supporting same to form an enclosure both for the complete door when open and for the margins thereof and the supporting mechanism when closed.

9,221 of 1905.—T. M. THOM: *Manufacture of Artificial Marble and the like.*

The manufacture of artificial marble and the like, consisting in the employment of a solution containing 25 parts by weight of sodium chloride, 1 part potassium chloride, 5 parts magnesium chloride, 2½ parts magnesium sulphate, and 1 part of calcium sulphate and 7 oz. of mixed salts to every one gallon of water.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

July 20.—By J. HARRIS & SON (at Ropley).

Ropley, Hants.—Four freehold fields, 17 a. 1 r. 1 p.	£202
A freehold building site, 8 a. 0 r. 33 p.	300
Three freehold plots, 3 a. 3 r. 36 p.	150
Five freehold building plots, 2 a. 3 r. 4 p.	119
Six freehold building plots	129

By H. J. BURT (at Brighton).

Shermanbury, etc., Sussex.—Freehold farms, lands, etc. (Wisden Estate), area 728 a., f. (in numerous lots)	13,781

July 21.—By J. HANNAFORD & SON (at Exeter).

Burrington, etc., Devon.—Freehold farms, lands, etc. (Earl Portsmouth's Estates), area 2,771 a., f. (in numerous lots)	40,647

July 22.—By W. BROWN & CO. (at Aylesbury).

Tetchwick, Bucks.—"Rookery Farm," 87 a. 0 r. 11 p., f., y.r. 145*l.*	2,750
Enclosure of pasture, 17 a. 2 r. 10 p., f., y.r. 24*l.*	485

By HARRY BALL (at Bedford).

Bedford.—De Parys-av., freehold land, area 7,200 ft.	300
Kempston, Beds.—84, High-st., and 0 a. 2 r. 1 p., f., p.	350
Freehold cottage and 1 a. 1 r. 20 p., f., y.r. 18*l.*	155
Enclosure of land, 3 a. 0 r. 29 p., f.	150

July 24.—By CHANCELLOR & SONS.

Sunningdale, Berks.—Station-rd., "St. Ann's Cottages" (seven), f., w.r. 100*l.* 2s.	1,700

By H. & R. L. COBB.

Kentish Town.—Savernake-rd., etc., l.g.r., 125*l.* 15s., u.t. 62½ yrs., g.r., 40*l.* 10s.	1,800
Notting-hill.—Portobello-rd., f.g.r. 51*l.*, reversion in 61 yrs.	1,375
Limehouse.—6, 10, 12, 14, and 16, Beccles-st., f., w.r. 178*l.* 2s.	1,870
18, Beccles-st., and 2 and 4, Gill-pl., f., w.r. 58*l.* 10s.	620
7, 11 to 21 (odd), and 13A, Gill-st., f., w.r. 239*l.* 16s.	2,420
Gill-st., f.g.r. 11*l.* 5s., reversion in 53 yrs.	340
20 to 26, 30 to 38 (even), 42, 44, 50, and 52, Gill-st., f., w.r. 361*l.* 13s.	3,210

By C. RAWLEY CROSS & Co.

Hammersmith.—47, Ashchurch-gr., u.t. 84 yrs., g.r. 7*l.*, y.r. 45*l.* £425

By MORGAN, BAINES, & CLARK.

Sutton, Surrey.—Brunswick-rd., "Kenwood," part freehold and part u.t. 61 yrs., g.r. 10*l.*, e.r. 100*l.* 850

By NIGHTINGALE, PHILLIPS, & PAGE.

Thames Ditton, Surrey.—Portsmouth-rd., "Pembroke Lodge," f., p. 550

By NOKES & NOKES.

South Lambeth.—63 to 69 (odd), 73 and 75, Tradescant-rd., u.t. 65¼ yrs., g.r. 45*l.*, w.r. 309*l.* 8s. 2,340

Fulham.—55, 56, and 57, Victoria-rd., u.t. 48 yrs., g.r. 15*l.*, w.r. 80*l.* 12s. 360

By WEATHERALL & GREEN.

Barnsbury.—Upper Park st., two peppercorn freehold ground rents, reversion in 3¾ yrs. 1,025

Pimlico.—Ranelagh-gr., etc., i.g.r. 92*l.* 10s., reversion in 17½ yrs., g.r. 4*l.* 10s. 950

Strand.—Clare Market, f.g.r. 63*l.*, reversion in 6 yrs. 1,800

Clare Market, i.g.r. 92*l.*, u.t. 6 yrs., g.r. 63*l.* 104

Clerkenwell.—11, 12, 13, and 14, Gt. Bath-st., f., y.r. 160*l.* 2,700

Clerkenwell-green, f.g.r. 100*l.*, reversion in 50 yrs. 2,500

Clerkenwell-green, f.g.r. 45*l.*, reversion in 41 yrs. 1,000

By VENTOM, BULL, & COOPER.

Mile End.—Cambridge-rd., "The Royal Foresters' Music Hall"; also "The Artichoke Tavern," and shop adjoining, u.t. 61¼ and 173 yrs., g.r. 135*l.*, p. 20,000

Hampstead.—Elm Row, "Elmleigh," f., p. .. 1,375

Watford, Herts.—Upton-rd., "Clovelly" and "Langton," f., y.r. 160*l.* 2,045

Upton-rd., "Ythan," f., p. 1,000

Rosslyn-rd., a freehold plot of land 500

July 25.—DEBENHAM, TEWSON, & Co.

City.—4, Corbet-ct. (offices), area 1,170 ft., u.t. 30 yrs., g.r. 125*l.*, y.r. 550*l.* 6,500

Hyde Park.—Oxford-ter., etc., i.g. rents 104*l.* 10s., u.t. 15¼ yrs., g.r. 2*l.* (with reversion) 1,310

Cambridge-ter., etc., i.g. rents 127*l.*, u.t. 27¼ yrs., g.r. nil 1,650

Camden Town.—Rochester-sq., etc., i.g.r. 34*l.*, u.t. 41 yrs., g.r. nil 600

St. Paul's-rd., etc., i.g.r., 90*l.*, u.t. 39 yrs., g.r. nil 1,460

Norwood.—197, 199, and 201, Knight's Hill-rd., f., y.r. 74*l.*, also f.g.r. 10*l.*, reversion in 43¼ yrs. 1,300

Cheshunt, Herts.—Park-la., "Roundcroft," with farmery and 5 a. 1 r. 10 p., f. 2,000

Park-la., freehold building land, 5 a. 0 r. 33 p. 950

Appleby-st., freehold building land, 10 a. 1 r. 2 p. 1,525

Longfield-la., freehold building land, 0 a. 2 r. 10 p. 240

Bishopsteignton, Devon.—"The Lodge Farm," 63 a. 0 r. 31 p., f., y.r. 110*l.* 2,875

Handcross, Sussex.—1, 2, and 3, Highbury-cottages, f., w.r. 44*l.* 650

"Archpool House" and two houses and shops adjoining, f., y.r. 90*l.* 1,400

"Rose Cottage" and 0 a. 2 r. 28 p., f., y.r. 40*l.* 625

Three freehold cottages and shop, y.r. 49*l.* .. 650

Eldersfield, etc., Worcester.—"Cromer Farm," 177 a. 2 r. 33 p., f., y.r. 200*l.* 3,700

By D. BURNETT & Co.

Tottenham.—Ferndale-rd., f.g. rents 126*l.*, reversion in 73½ yrs. 3,020

Fairview-rd., f.g. rents 250*l.*, reversion in 84 to 94 yrs. 6,000

Richmond, Surrey.—8 and 10, Onslow-av., u.t. 89½ yrs., g.r. 18*l.*, y.r. 105*l.* 700

By C. W. DAVIES & SON.

Clerkenwell.—282, Goswell-rd. (Turkish baths), u.t. 8½ yrs., y.r. 50*l.*, with goodwill, fixtures, etc. 346

City-road.—5, Alfred-st., u.t. 21 yrs., g.r. 4*l.* 4s., e.r. 42*l.* 270

Barnsbury.—28, Huntingdon-st., u.t. 45 yrs., g.r. 7*l.*, e.r. 46*l.* 520

De Beauvoir Town.—16, Southgate-gr., u.t. 14½ yrs., g.r. 1*l.*, y.r. 40*l.* 350

Haggerston.—13 to 23 (odd), Ilva-pl., f., w.r. 163*l.* 16s. 925

Clerkenwell.—24, Lloyd-sq., u.t. 16 yrs., g.r. 3*l.*, y.r. 45*l.* 335

Islington.—Cloudesley-rd., f.g.r. 4*l.*, reversion in 18 yrs. 220

Canonbury.—10, Quadrant-rd., u.t. 40 yrs., g.r. 8*l.*, e.r. 55*l.* 485

By FULLER, HORSEY, SONS, & CASSELL.

Fambridge, Essex.—Freehold electrical engineering works, area 35 a. 2 r. 10 p. (as a going concern) 9,000

"Fambridge Hall Farm," 575 a. 1 r. 8 p., f. 7,000

By HAMPTON & SONS.

Chieveley, Berks.—"Arlington Manor Estate," 595 a. 2 r. 26 p., f. 30,100

By KEMSLEY'S.

St. George's East.—18, Ellen-st., f., w.r. 26*l.* 350

By PROTHEROE & MORRIS.

Carshalton.—Denmark-rd., two freehold building sites 680

By RANDALL, COX, & BAKER.

Crouch-hill.—27, Sparsholt-rd., u.t. 40½ yrs., g.r. 5*l.* 10s., e.r. 38*l.* 200

By WALTER SIMMONDS

Southwark.—2 and 4, Lant-st., f., y.r. 30*l.* .. 700

Peckham.—1, 2, and 3, Senate-st., u.t. 64½ yrs., g.r. 12*l.*, w.r. 72*l.* 16s. 450

By F. WARMAN.

Oakley Park.—"Oaklawn" and nearly 1 a., f., y.r. 120*l.* 1,920

Highbury.—47, Aberdeen-pk., u.t. 71½ yrs., g.r. 20*l.*, y.r. 110*l.* 1,000

Enfield.—Byculiah-rd., "Sherwood" and ¼ an acre, f., y.r. 95*l.* 1,300

By THOMAS WRIGHT.

Brixton.—22, Winterwell-rd., u.t. 58 yrs., g.r. 8*l.* 2s. 6d., y.r. 44*l.* 330

By H. & R. L. COBB (at Rochester).

Gillingham, Kent.—"The Eight Acres," 9 a. 1 r. 25 p., f. £375

Grange, Kent.—Tithe rent-charge of 12*l.* 10s. 150

Frindsbury, Kent.—"Rosehill Cottage" and 3 a. 1 r. 7 p., f., y.r. 26*l.* 450

Hoo, Kent.—Freehold house, kennels, two cottages and 48 a. 1 r. 23 p. 2,100

By J. C. PLATT (at Hammersmith).

Hammersmith.—King-st. West, f.g. rents 28*l.*, reversion in 12½ yrs. 1,920

By S. WALKER & SON (at Dunmow).

Dunmow, Essex.—Chelmsford-rd., "Chelmsford House," and 2 a. 1 r. 33 p., f., y.r. 29*l.* 6s. 8d. 480

By DRIVER, JONAS, & Co. (at Selby).

Selby, Yorks.—Portholme-rd., freehold house and 2 a. 0 r. 12 p., y.r. 75*l.* 1,700

14 and 15, Water-la., f., w.r. 23*l.* 6s. 280

Ousegate Iron Works, f., y.r. 52*l.* 1,500

5 and 7, The Cres., f., y.r. 57*l.* 1,675

8, 10, 11, 12, 14, and 15, The Cres. (s.), f., y.r. 175*l.* 5,250

The Market-pl. freehold bank premises and residence, y.r. 70*l.* 1,800

11 to 15, The Market-pl. (s.), f., y.r. 208*l.* .. 6,140

81 and 82, Gowthorpe, also three cottages, f., 770

Thrope-rd., freehold building plot 115

5, Finkle-st. (s.), f., y.r. 28*l.* 975

James-st., etc., twenty freehold cottages .. 1,340

James-st., freehold building site 585

7, 8, 11, and 12, Park-st., f. y.r. 135*l.* 3,350

July 26.—By BAXTER, PAYNE, & LEPPER.

Penge.—67 to 81 (odd), Beckenham-rd. (s.), f., y.r. 415*l.* 4,020

Bromley, Kent.—36, Palace-gr., u.t. 950 yrs., g.r. 6*l.*, e.r. 52*l.* 10s. 500

197, 199, and 201, Homesdale-rd., f., w.r. 80*l.* 12s. 850

By ALLAN BOOTH.

Camden Town.—5, Rochester-ter., u.t. 38½ yrs., g.r. 6*l.* 10s., y.r. 52*l.* 490

23, Rochester-rd. (with studio), u.t. 39½ yrs., g.r. 6*l.*, y.r. 50*l.* 455

By BOWER, BINNS, & EWBANK.

Weybridge, Surrey.—Pine-gr., "Woodlands" and 1 a., f., y.r. 120*l.* 2,145

By T. DIXON & SONS.

Belgravia.—51, Chester-ter., u.t. 15½ yrs., g.r. 5*l.*, e.r. 60*l.* 320

By OAKLEY, FISHER, & Co.

Regent's Park.—4, St. George's-ter., f., e.r. 85*l.* 1,050

By J. S. RICHARDSON.

City.—33 and 35, Moor-la. (business premises), area 3,000 ft., u.t. 53 yrs., g.r. 350*l.*, y.r. 760*l.* 1,600

Brondesbury.—35, 39 to 51, 55 to 61 (odd), Loveridge-rd., u.t. 72¼ yrs., g.r. 90*l.*, y.r. 240*l.* 3,270

Sydenham.—10, Cator-rd., u.t. 74½ yrs., g.r. 12*l.* 10s., y.r. 70*l.* 680

By RUSHWORTH & STEVENS.

Regent's-street.—60, Conduit-st. (business premises), Corporation lease, g.r. 6*l.* 5s., fine 43*l.* 15s., y.r. 450*l.* 12,100

By R. TIDEY & SON.

Caledonian-road.—63, North-street, u.t. 39 yrs., g.r. 6*l.*, y.r. 32*l.* 255

By DOUGLAS YOUNG & Co.

Enfield (Bush Hill-pk.).—21 to 24, Main-st., u.t. 84 yrs., g.r. 12*l.*, w.r. 97*l.* 10s. 480

By ESCRITT & BARRELL (at Boston).

Great Hale, etc., Lincs.—"The Abbey Parks Farm," 563 a. 0 r. 19 p., f. 20,125

By ALFRED RICHARDS (at Walthamstow).

Walthamstow.—1 and 3, Silverdale-rd., f., w.r. 65*l.* 640

By WYATT & SON (at Chichester).

Felpham, Sussex.—Part of Thompson's Hospital Farm, 24 a. 2 r. 2 p., f. 1,025

July 27.—By BATCHELAR & SON.

Harrow, Middx.—32, St. Kilda's-rd., f., e.r. 30*l.* 345

By C. C. & T. MOORE.

Stepney.—15, 16, 23, and 24, Walter-st., u.t. 11¼ yrs., g.r. 4*l.*, w.r. 120*l.* 18s. 285

Victoria Park.—9 and 10, St. James'-rd., u.t. 25 yrs., g.r. 9*l.* 10s., y.r. 72*l.* 400

Limehouse.—33 and 35, Acland-st., u.t. 68 yrs., g.r. 9*l.*, w.r. 75*l.* 8s. 600

70, Three Colt-st. (s.), f., y.r. 20*l.* 360

Bethnal Green.—1w, Cranbrook-st., f., w.r. 31*l.* 4s. 315

East Ham.—High-st. North, f.g.r. 10*l.* 10s., reversion in 93 yrs. 255

By NEWBON, EDWARDS, & SHEPHARD.

Hackney.—4, 6, 8, and 10, Cricketfield-rd., f., y.r. 160*l.* 2,455

Clapton.—11, Goulton-rd., f., y.r. 50*l.* 680

Hoxton.—119, Hoxton-st. (s.), f., y.r. 32*l.* .. 605

Battersea.—Culvert-rd., f.g.r. 17*l.* 10s., reversion in 60¼ yrs. 370

Chatham-st., f.g.r. 9*l.*, reversion in 60¼ yrs. 205

Leytonstone.—Holloway-rd., f.g.r. 22*l.* 10s., reversion in 61 yrs. 520

Peckham.—Gordon-rd., f.g. rents, 27*l.* 10s., reversion in 61 yrs. 750

Hackney.—72, King Edward-rd., u.t. 31 yrs., g.r. 12*l.*, e.r. 70*l.* 400

Islington.—32, Duncan-ter (with stable), u.t. 21 yrs., g.r. 11*l.*, e.r. 80*l.* 400

Wood Green.—Winkfield-rd., f.g.r. 13*l.*, reversion in 99 yrs. 295

By RAMSAY, WAINWRIGHT, & Co.

Stamford Hill.—98 to 120 (even), Tewkesbury-rd., u.t. 71 yrs., g.r. 57*l.*, w.r. 280*l.* 16s. .. 1,000

By RUTTERS'.

Blackmore, Essex.—"Springfield" enclosure, 4¼ a., f. 150

By A. W. TAYLOR & Co.

Fulham.—21, Lillie-rd., with yard and stabling, u.t. 23 yrs., g.r. 9*l.*, p. 410

17, Lillie-rd., with farrier's shop, stabling, etc., also 1A, Seagrave-rd. (s.), u.t. 27½ yrs., g.r. nil, p. 835

1, Lillie-yd. (stable), u.t. 27½ yrs., g.r. 5*l.*, p. 100

Putney.—14 and 16, Wymond-st., u.t. 69 yrs., g.r. 12*l.*, y.r. 64*l.* £600

By TRAFFORD & CARTER.

Brixton.—28, Kellett-rd., u.t. 69 yrs., g.r. 6*l.* 17s., y.r. 38*l.* 315

By WM. WESTON.

Willesden.—40 and 42, Mayo-rd., u.t. 78¼ yrs., g.r. 10*l.*, w.r. 62*l.* 8s. 400

Kensal Green.—10, Berens-rd., u.t. 80 yrs., g.r. 5*l.* 10s., y.r. 34*l.* 340

By STIMSON & SONS.

St. Luke's.—10 and 12, Norman's-buildings (factory), u.t. 43½ yrs., g.r. 40*l.*, y.r. 100*l.* 870

Islington.—129, Packington-st. (s.), u.t. 31 yrs., g.r. 6*l.*, y.r. 48*l.* 400

Clerkenwell.—9, 14, and 18, Wilmington-sq., u.t. 8¾ and 10½ yrs., g.r. 32*l.* 10s., y.r. 173*l.* 590

Hornsey.—146, North View-rd. (s.), f., y.r. 50*l.* 650

Stoke Newington.—2 to 12 (even), Lancell-st., f., y.r. 90*l.* 1,880

54, Church-st. (s.), u.t. 65½ yrs., g.r. 7*l.* 15s., y.r. 52*l.* 450

Bow.—Tredegar-rd., i.g.r. 14*l.* 10s., u.t. 43 yrs., g.r. 1*l.* 10s. 205

Barnsbury.—162, Barnsbury-rd. (s.), f., y.r. 48*l.* 490

43 and 45, Rhodes-st. (s.), u.t. 52¾ yrs., g.r. 5*l.*, y.r. 35*l.* 350

36, Ellington-st., u.t. 46¾ yrs., g.r. 8*l.*, y.r. 48*l.* 450

Islington.—276, Essex-rd., u.t. 12¼ yrs., g.r. nil, w.r. 54*l.* 12s. 100

Caledonian-road.—No. 162 (s.), u.t. 26 yrs., g.r. 10*l.*, y.r. 40*l.* 300

Highbury.—137, Riversdale-rd. (s.), f., y.r. 48*l.* 460

Highgate.—29, Archway-rd. (s.), u.t. 89¾ yrs., g.r. 12*l.*, y.r. 65*l.* 700

Holloway.—34, Kingsdown-rd., u.t. 32¾ yrs., g.r. 6*l.* 6s., y.r. 36*l.* 300

31, Bickerton-rd., f., y.r. 46*l.* 570

By HENRY HENDRIKS (at Birmingham).

Sparkhill, Worcester.—Oakwood-rd., f.g.r. 24*l.*, reversion in 92 yrs. 650

King's Heath, Worcester.—Station-rd., etc., f.g. rents 70*l.* 15s., reversion in 91 and 93 yrs. 1,780

Smethwick, Staffs.—Montague-rd., f.g.r. 27*l.*, reversion in 91 yrs. 690

Birmingham, Warwick.—Duddeston Mill-rd., f.g.r. 6*l.* 16s. 8d., reversion in 47 yrs. 155

July 28.—By DAVID BURNETT & Co.

Crouch Hill.—Mount View-rd., f.g. rents 102*l.* 10s., reversion in 76½ yrs. 2,985

Elm-gr., f.g.r. 42*l.*, reversion in 76½ yrs. .. 1,195

Ella-rd., f.g. rents 88*l.* 8s., reversion in 76½ yrs. 2,540

Shepherd's Bush.—Askew-rd., f.g. rents 26*l.*, reversion in 60 yrs. 790

Bassein Park-rd., f.g. rents 201*l.*, reversion in 60, 64, and 66 yrs. 5,130

By A. & A. FIELD.

North Woolwich.—66 and 67, Albert-rd. (s.), f., y.r. 70*l.* 2s. 450

Canning Town.—39 and 41, Garvary-rd., f., w.r. 36*l.* 8s. 180

13 to 19, 37 to 63 (odd), 58, 60, 76 to 88 (even), Leyes-rd., u.t. 75¼ yrs., g.r. 81*l.*, w.r. 538*l.* 4s. 1,310

By WALTER HALL.

Brondesbury.—90 to 96 (even), Hanover-rd., u.t. 96¼ yrs., g.r. 28*l.*, e.r. 230*l.* 1,500

By W. A. HEAD.

Clapham.—38, Osborne-ter., u.t. 32¼ yrs., g.r. 7*l.* 10s., e.r. 48*l.* 315

Brixton.—23, 25, and 29, Burton-rd., u.t. 30 yrs., g.r. 12*l.* 10s., y.r. 120*l.* 950

By J. H. LYNCH.

Soho.—32 and 33, New Compton-st., u.t. 30½ yrs., g.r. 80*l.*, w.r. 205*l.* 8s. 620

63, New Compton-st. (s.), u.t. 28 yrs., g.r. 56*l.*, y.r. 12*l.* 530

By MARK LIELL & SON.

Manor Park.—Romford-rd., f.g. rents 48*l.*, reversion in 87 and 93 yrs. 1,200

Upton Park.—St. George's-rd., f.g. rents 74*l.*, reversion in 86 and 87 yrs. 1,690

Leyton.—Belmont Park-rd., f.g.r. 17*l.* 10s., reversion in 99 yrs. 390

By MARTEN & CARNABY.

Dulwich.—111, Thurlow Park-rd., u.t. 50 yrs., g.r. 16*l.* 7s. 6d., e.r. 125*l.* 1,550

By STIMSON & SONS.

Harringay.—140 and 142, Harringay-rd., f., y.r. 52*l.* 500

Wood Green.—93, 97, 99, and 101, High-rd. (s.), f., y.r. 200*l.* 4,400

New Southgate.—20, Parkhurst-rd., f., y.r. 28*l.* 360

Tottenham.—32 and 34, Avenue-rd., f., y.r. 66*l.* 2s. 550

Edmonton.—Hertford-rd., i.g.r. 16*l.* 16s., u.t. 59 yrs., g.r. 6*l.* 165

Watford, Herts.—Aldenham-rd., two freehold building plots 300

Bermondsey.—36, Keeton's-rd., f., w.r. 41*l.* 12s. 420

Rotherhithe.—56, Barkworth-rd., u.t. 71¼ yrs., g.r. 5*l.* 200

Maynard-rd., i.g.r. 15*l.*, u.t. 46 yrs., g.r. 5s. 250

Deptford.—182 and 184, Lower-rd. (s.), u.t. 43 yrs., g.r. 60*l.*, y.r. 90*l.* 250

Brockley.—1, Montague-av., u.t. 60 yrs., g.r. 9*l.*, y.r. 50*l.* 550

By WOODS & SNELLING.

Wimbledon.—69, Haydons-rd. (s.), u.t. 75½ yrs., g.r. 5*l.* 10s., y.r. 34*l.* 210

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard; gr. for grove; b.h. for beerhouse; p.h. for public-house; o. for offices; s. for shops; ct. for court.

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PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.	
Hard Stocks	1 8 0	per 1000 alongside, in river.
Rough Stocks and Grizzles	1 4 0	" " "
Facing Stocks	2 0 0	" " "
Shippers	2 0 0	" " "
Flettons	1 7 0	" at railway depôt.
Red Wire Cuts	1 14 0	" " "
Best Fareham Red	3 12 0	" " "
Best Red Pressed Ruabon Facing	5 0 0	" " "
Best Blue Pressed Staffordshire	4 2 6	" " "
Do. Bullnose	4 7 6	" " "
Best Stourbridge Fire Bricks	4 0 0	" " "
GLAZED BRICKS.		
Best White and Ivory Glazed Stretchers	12 0 0	" " "
Headers	11 0 0	" " "
Quoins, Bullnose, and Flats	16 0 0	" " "
Double Stretchers	19 0 0	" " "
Double Headers	16 0 0	" " "
One Side and two Ends	19 0 0	" " "
Two Sides and one End	20 0 0	" " "
Splays, Chamferred, Squints	20 0 0	" " "
Best Dipped Salt Glazed Stretchers, and Header Quoins, Bullnose, and Flats	12 0 0	" " "
	14 0 0	" " "
Double Stretchers	15 0 0	" " "
Double Headers	14 0 0	" " "
One Side and two Ends	15 0 0	" " "
Two Sides and one End	15 0 0	" " "
Splays, Chamferred, Squints	14 0 0	" " "
Second Quality White and Dipped Salt Glazed	2 0 0	" less than best.

	s. d.	
Thames and Pit Sand	7 0	per yard, delivered.
Thames Ballast	5 9	" "
Best Portland Cement	27 0	per ton, "
Best Ground Blue Lias Lime	20 0	" "

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime.....12s. 0d. per yard, delivered.
Stourbridge Fireclay in sacks 27s. 0d. per ton at rly. dpt.

STONE.

	s. d.	
BATH STONE—delivered on road waggons, Paddington Depôt	1 6½	per ft. cube.
Do. do. delivered on road waggons, Nine Elms Depôt	1 8½	" "
PORTLAND STONE (20 ft. average)—Brown Whitbed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf	2 1	" "
White Basebed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf	2 2½	" "

	s. d.	
Ancaster in blocks	1 11	per ft. cube, deld. rly. depôt.
Beer "	1 6	" "
Greenshill "	1 10	" "
Darley Dale in blocks	2 4	" "
Red Corsehill "	2 5	" "
Closeburn Red Freestone	2 0	" "
Red Mansfield "	2 4	" "
YORK STONE—*Robin Hood Quality.*		
Scappled random blocks	2 10	" "
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2 3	per ft. super. "
6 in. rubbed two sides ditto, ditto	2 6	" "
3 in. sawn two sides slabs (random sizes)	0 11½	" "
2 in. to 2½ in. sawn one side slabs (random sizes)	0 7½	" "
1½ in. to 2 in. ditto, ditto	0 6	" "
HARD YORK—		
Scappled random blocks	3 0	per ft. cube. "
6 in. sawn two sides, landings to sizes (under 40 ft. super.)	2 8	per ft. super. "
6 in. rubbed two sides ditto	3 0	" "
3 in. sawn two sides (slabs random sizes)	1 2	" "
2 in. self-faced random flags	0 5	" "

STONE (*continued*).

	s. d.	
HARD YORK (*continued*)—		
Hopton Wood (Hard Bed) in blocks	2 0	per ft. cube. deld. rly. depôt.
" " " 6 in. sawn both sides landings	2 7	per ft. super. deld. rly. depôt.
" " " 3 in. sawn both sides random slabs	1 0	" "
" " " 2 in. do.	0 8½	" "

SLATES.

in. in.	£ s. d.	
20 × 10 best blue Bangor	13 2 6	per 1000 of 1200 at r. d.
20 × 12 " "	13 17 6	" "
20 × 10 first quality "	13 0 0	" "
20 × 12 " " "	13 15 0	" "
16 × 8 " " "	7 5 0	" "
20 × 10 best blue Portmadoc	12 12 6	" "
16 × 8 " "	6 12 6	" "
20 × 10 best Eureka unfading green	15 17 6	" "
20 × 12 " "	18 7 6	" "
18 × 10 " "	13 5 0	" "
16 × 8 " "	10 5 0	" "
20 × 10 permanent green	11 12 6	" "
18 × 10 " "	9 12 6	" "
16 × 8 " "	6 12 6	" "

TILES.

	s. d.	
Best plain red roofing tiles	42 0	per 1000 at rly. depôt.
Hip and Valley tiles	3 7	per doz. " "
Best Brosely tiles	50 0	per 1000 " "
Do. Ornamental tiles	52 6	" " "
Hip and Valley tiles	4 0	per doz. " "
Best Ruabon red, brown, or brindled do. (Edwards)	57 6	per 1000 " "
Do. Ornamental do	60 0	" " "
Hip tiles	4 0	per doz. " "
Valley tiles	3 0	" " "
Best Red or Mottled Staffordshire do. (Peakes)	51 9	per 1000 " "
Do. Ornamental do	54 6	" " "
Hip tiles	4 1	per doz. " "
Valley tiles	3 8	" " "
Best "Rosemary" brand plain tiles	48 0	per 1000 " "
Best Ornamental tiles	50 0	" " "
Hip tiles	4 0	per doz. " "
Valley tiles	3 8	" " "
Best "Hartshill" brand plain tiles, sand faced	50 0	per 1000 " "
Do. pressed	47 6	" " "
Do. Ornamental do	50 0	" " "
Hip tiles	4 0	per doz. " "
Valley tiles	3 6	" " "

WOOD.

BUILDING WOOD.	At per standard. £ s. d.	£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in	13 10 0	15 0 0
Deals: best 3 by 9	13 0 0	14 0 0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.	11 0 0	12 0 0
Battens: best 2½ by 6 and 3 by 6	0 10 0	less than 7 in. and 8 in.
Deals: seconds	1 0 0	less than best.
Battens: seconds	0 10 0	" " "
2 in. by 4 in. and 2 in. by 6 in.	9 0 0	10 0 0
2 in. by 4½ in. and 2 in. by 5 in.	8 10 0	9 10 0
Foreign Sawn Boards— 1 in. and 1¼ in. by 7 in.	0 10 0	more than battens.
¾ in.	1 0 0	"
	At per load of 50 ft.	
Fir timber: best middling Danzig or Memel (average specification)	4 10 0	5 0 0
Seconds	4 0 0	4 10 0
Small timber (8 in. to 10 in.)	3 12 6	3 15 0
Small timber (6 in. to 8 n.)	3 0 0	3 10 0
Swedish balks	2 10 0	3 0 0
Pitch-pine timber (30 ft. average)	3 5 0	3 15 0
JOINERS' WOOD.	At per standard.	
White Sea: first yellow deals, 3 in. by 11 in	24 0 0	25 0 0
3 in. by 9 in.	22 0 0	23 0 0
Battens, 2½ in. and 3 in. by 7 in.	16 10 0	18 0 0
Second yellow deals, 3 in by 11 in.	18 10 0	20 0 0
" " 3 in. by 9 in.	17 10 0	19 0 0
Battens, 2½ in. and 3 in. by 7 in.	13 10 0	14 10 0
Third yellow deals, 3 in. by 11 in. and 9 in.	13 10 0	15 0 0
Battens, 2½ in. and 3 in. by 7 in.	11 0 0	12 0 0
Petersburg: first yellow deals, 3 in. by 11 in.	21 0 0	22 10 0
Do. 3 in. by 9 in.	18 0 0	19 10 0
Battens	13 10 0	15 0 0
Second yellow deals, 3 in. by 11 in.	16 0 0	17 0 0
Do. 3 in. by 9 in.	14 10 0	16 0 0
Battens	11 0 0	12 10 0
Third yellow deals, 3 in. by 11 in.	13 0 0	14 0 0
Do. 3 in. by 9 in.	12 10 0	14 0 0
Battens	10 0 0	11 0 0
White Sea and Petersburg:— First white deals, 3 in. by 11 in.	14 10 0	15 10 0
" " 3 in. by 9 in.	13 10 0	14 10 0
Battens	11 0 0	12 0 0
Second white deals, 3 in. by 11 in.	13 10 0	14 10 0
" " 3 in. by 9 in.	12 10 0	13 10 0
" " battens	10 0 0	11 0 0
Pitch-pine: deals	16 10 0	20 0 0
Under 2 in. thick extra	0 10 0	1 0 0
Yellow Pine—First, regular sizes	44 0 0	upwards.
Oddments	32 0 0	"
Seconds, regular sizes	33 0 0	"
Yellow Pine oddments	28 0 0	"
Kauri Pine—Planks, per ft. cube	0 3 6	0 5 0
Danzig and Stettin Oak Logs— Large, per ft. cube	0 3 0	0 3 6
Small " "	0 2 6	0 2 9
Wainscot Oak Logs, per ft. cube	0 5 0	0 5 6
Dry Wainscot Oak, per ft. sup. as inch	0 0 8	0 0 9
¾ in. do. do.	0 0 7	—

WOOD (*continued*).

JOINERS' WOOD (*continued*)—	At per standard. £ s. d.	£ s. d.
Dry Mahogany—Honduras, Tabasco, per ft. super. as inch	0 0 9	0 1 0
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 6
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0
Teak, per load	17 0 0	22 0 0
American Whitewood Planks, per ft. cube	0 4 0	0 5 0
Prepared Flooring, etc.—	Per square.	
1 in. by 7 in. yellow, planed and shot	0 13 6	0 17 6
1 in. by 7 in. yellow, planed and matched	0 14 0	0 18 0
1¼ in. by 7 in. yellow, planed and matched	0 16 0	1 0 0
1 in. by 7 in. white, planed and shot	0 12 0	0 14 6
1 in. by 7 in. white, planed and matched	0 12 6	0 15 0
1¼ in. by 7 in. white, planed and matched	0 15 0	0 16 6
¾ in. by 7 in. yellow, matched and beaded or V-jointed brds.	0 11 0	0 13 6
1 in. by 7 in. do. do.	0 14 0	0 18 0
¾ in. by 7 in. white do. do.	0 10 0	0 11 6
1 in. by 7 in. do. do. do.	0 12 9	0 15 0

6 in. at 6d. to 9d. per square less than 7 in.

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	6 0 0 ...	6 15 0
Compound Girders, ordinary sections	7 10 0 ...	8 10 0
Steel Compound Stancheons	9 2 6 ...	10 12 6
Angles, Tees and Channels, ordinary sections	7 10 0 ...	8 10 0
Flitch Plates	7 15 0 ...	8 5 0
Cast Iron Columns and Stanchions including ordinary patterns	6 12 6 ...	7 15 0

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON—		
Common Bars	7 0 0 ...	7 10 0
Staffordshire Crown Bars, good merchant quality	7 10 0 ...	8 0 0
Staffordshire "Marked Bars"	9 10 0 ...	—
Mild Steel Bars	8 5 0 ...	8 15 0
Hoop Iron, basis price	8 15 0 ...	9 0 0
" Galvanized	16 10 0 ...	—
(*And upwards, according to size and gauge.)		
Sheet Iron, Black—		
Ordinary sizes to 20 g.	9 0 0 ...	—
" " 24 g.	10 0 0 ...	—
" " 26 g.	11 15 0 ...	—
Sheet Iron, Galvanised, flat, ordinary quality—		
Ordinary sizes—6 ft. by 2 ft. to 3 ft. to 20 g.	12 10 0 ...	—
Ordinary sizes to 22 g. and 24 g.	13 0 0 ...	—
" " 26 g.	14 0 0 ...	—
Sheet Iron, Galvanised, flat, best quality—		
Ordinary sizes to 20 g.	15 10 0 ...	—
" " 22 g. and 24 g.	16 0 0 ...	—
" " 26 g.	17 10 0 ...	—
Galvanised Corrugated Sheets—		
Ordinary sizes 6 ft. to 8 ft. 20 g.	12 10 0 ...	—
" " 22 g. and 24 g.	13 0 0 ...	—
" " 26 g.	13 15 0 ...	—
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	11 0 0 ...	—
Best Soft Steel Sheets, 22 g. & 24 g.	12 0 0 ...	—
" " 26 g.	13 10 0 ...	—
Cut nails, 3 in. to 6 in.	9 0 0 ...	9 10 0
(Under 3 in., usual trade extras.)		

LEAD, &c.

	Per ton, in London. £ s. d.	£ s. d.
LEAD—Sheet, English, 3lb. and up	16 17 6 ...	—
Pipe in coils	17 7 6 ...	—
Soil pipe	19 17 6 ...	—
Compo pipe	19 17 6 ...	—
ZINC—Sheet—		
Vieille Montagne ton	29 15 0 ...	—
Silesian	29 10 0 ...	—
COPPER—		
Strong Sheet per lb.	0 0 11 ...	—
Thin " "	0 1 0 ...	—
Copper nails "	0 0 11 ...	—
BRASS—		
Strong Sheet "	0 0 10 ...	—
Thin " "	0 0 11 ...	—
TIN—English Ingots "	0 1 5½ ...	—
SOLDER—Plumbers' "	0 0 6½ ...	—
Tinmen's "	0 0 8 ...	—
Blowpipe "	0 0 9 ...	—

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2½d.	per ft. delivered.
" fourths	1½d.	" "
21 oz. thirds	3½d.	" "
" fourths	2½d.	" "
26 oz. thirds	4½d.	" "
" fourths	3½d.	" "
32 oz. thirds	5½d.	" "
" fourths	4½d.	" "
Fluted Sheet, 15 oz.	3½d.	" "
" 21 oz.	4½d.	" "
⅛ Hartley's Rolled Plate	2d.	" "
¼ " " "	2½d.	" "
½ " " "	2½d.	" "

OILS, &c.

		£ s. d.
Raw Linseed Oil in pipes	per gallon	0 1 8½
" " " in barrels	"	0 1 10
" " " in drums	"	0 2 0
Boiled " " in pipes	"	0 1 11
" " " in barrels	"	0 2 0
" " " in drums	"	0 2 2
Turpentine, in barrels	"	0 3 9
" in drums	"	0 3 11
Genuine Ground English White Lead	per ton	19 15 0
Red Lead, Dry	"	19 5 0
Best Linseed Oil Putty	per cwt.	0 6 6
Stockholm Tar	per barrel	1 12 0

VARNISHES, &c.	Per gallon. £ s. d.
Fine Pale Oak Varnish	0 8 0
Pale Copal Oak	0 10 6
Superfine Pale Elastic Oak	0 12 6
Fine Extra Hard Church Oak	0 10 0
Superfine Hard-drying Oak, for seats of Churches	0 14 0
Fine Elastic Carriage	0 12 6
Superfine Pale Elastic Carriage	0 16 0
Fine Pale Maple	0 16 0
Finest Pale Durable Copal	0 18 0
Extra Pale French Oil	1 1 0
Eggshell Flatting Varnish	0 18 0
White Copal Enamel	1 4 0
Extra Pale Paper	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 0
French and Brush Polish	0 10 0

TO CORRESPONDENTS.

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We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article, or to execute or lend a drawing for publication, is given subject to the approval of the article or drawing, when received, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays.* [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is stated, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

*** Denotes *accepted.* † Denotes *provisionally accepted.***

ARNOLD (Notts).—For surface-water drains, St. Alban's-road, Furlong-street, Gelding-lane, etc., and Mansfield-road, Daybrook, for the Urban District Council. Mr. R. E. Clarke, Surveyor, Public Offices, Arnold, Notts. Quantities by Surveyor:—
A. Wayte & Son, Nottingham-rd., Arnold, Notts* £472
[Sixteen tenders sent in.]

BEDFONT (Middlesex).—For erecting a new Council school for 160 infants, for the Middlesex County Council. Mr. H. G. Crothall, Architect, The Guildhall, Westminster, S.W.:—

F. Gough & Co.	£2,274	0	0
W. Blackburn	2,079	0	0
Treasure & Son	2,065	0	0
J. Ward & Son	2,040	2	2½
H. Knight & Son	1,998	0	0
W. Lawrence & Son	1,997	0	0
W. J. Renshaw	1,997	0	0
Patman & Fotheringham	1,997	0	0
Kingerlee & Sons	£1,990	0	0
Fassnidge & Son	1,985	0	0
C. F. Kearley	1,955	0	0
A. & B. Hanson	1,937	0	0
F. G. Minter	1,896	0	0
Wisdom Bros.	1,815	0	0
J. Dorey & Co.	1,813	0	0
J. Barker & Co., 83, High-street, Kensington*	1,740	0	0

BROOKWOOD.—For new Council school, Brookwood, for the Surrey Education Committee. Messrs. Jarvis & Richards, architects, 36, Victoria-street, London, S.W.:—

Enness Bros.	£5,296	0	0
F. G. Minter	5,242	0	0
Sycamore Works, Ltd.	5,158	0	0
W. Beauchamp	4,991	12	7
Hudson & Co.	4,940	0	0
East & Hyde	4,772	0	0
J. Faggetter	4,758	0	0
W. J. Renshaw	4,740	0	0
Cropley & Son	4,739	0	0
W. Watson	4,736	2	4
Oak Building Co.	4,697	6	2
W. H. Hyde	4,658	0	0
Martin Wells & Co.	£4,625	0	0
E. C. Hughes	4,624	9	8
J. J. Shopland	4,618	0	0
Tribe & Robinson	4,595	0	0
R. Elvy	4,441	0	0
Fryer & Co.	4,336	11	10
Moss & Co.	4,326	17	7
Drowley & Co.	4,319	18	4
W. W. Gale	4,269	10	2
G. Kemp	4,157	0	0
T. J. Hawkins*	3,932	9	8

BURNHAM (Bucks).—For erecting new room and offices at Burnham mixed school, for the Managers. Messrs. Sargeant & Son, architects, Slough:—

F. W. Edwards	£1,245	0	
C. W. Cox & Sons	1,070	0	
Burfoot & Son	910	0	
F. Bisley	873	0	
H. D. Bowyer	821	0	
I. T. Harris	£809	0	
Ward & Son‡	827	18	
Burfoot & Butler, Slough‡*	798	0	

[Tenders marked ‡ include playground.]

CARDIFF.—For stands on the Cardiff Arms Park, for the Welsh Football Union and Cardiff Football Club. Messrs. Ivor Jones & T. E. Richards, architects and surveyors, 18, St. Mary-street, Cardiff. Quantities by the architects:—

G. Hallett	£1,667	H. Gibbon	£1,094
I. J. Chorley	1,278	Gibson Bros.	956
J. H. Venning	1,180		

[All of Cardiff.]

CHIPPENHAM.—For erecting a new school at Ivy-lane, for the Wilts County Council Education Committee. Messrs. Silcock & Reay, architects, 47, Milsom-street, Bath:—

G. Moore	£5,280	0	0
A. Wills & Sons	4,679	0	0
A. W. Long	4,664	18	0
Hayward & Wooster	4,562	0	0
W. Cowlin & Sons	4,557	0	0
Erwood & Morris	4,498	0	0
Downing & Rudman	4,364	0	0
Jacob, Long, & Sons	£4,243	0	0
E. Lindgey	4,178	0	0
E. Chancellor & Sons	4,170	0	0
H. & C. Spackman	4,095	0	0
A. J. Colborne	3,899	10	0
J. G. Norman, 62, Victoria-street, Swindon*	3,726	13	4

DERBY.—For alterations and additions to the aged and infirm men's building at the Union Workhouse, for the Guardians. Mr. F. C. Coulthurst, architect, 4, Albert-street, Derby. Quantities by architect:—
A. Brown & Son, Great Northern-road, Derby* .. £188

DEVONPORT.—For levelling, paving, and completing lane north of Keyham Barton Estate (section 1), for the Corporation. Mr. J. F. Burns, Borough Surveyor, Municipal Offices, 29, Ker-street, Devonport:—

Gefford & Sons	£336	19	7½
Pethick Bros.	317	12	6
E. L. P. Duke	317	4	1
T. Doney	£311	10	5
F. Donne, Devonport*	307	10	3

DEVONPORT.—For levelling, paving, and completing lane between Florence and Kathleavan-streets and rear of Victoria-road, for the Corporation. Mr. J. F. Burns, Borough Surveyor, Municipal Offices, 29, Ker-street, Devonport.

Jefford & Sons	£231	12	1
E. L. P. Duke	226	8	11
Pethick Bros.	225	19	8
T. Doney	£225	12	2
F. Donne, Devonport*	221	1	0

DEVONPORT.—For levelling, paving, and completing lane rear of south side of Whittington-street, for the Corporation. Mr. J. F. Burns, Borough Surveyor, Municipal Offices, 29, Ker-street, Devonport:—

A. C. Jones	£930	0	0
Jefford & Son	666	16	4
E. L. P. Duke	642	18	8
T. Doney	636	12	9
Pethick Bros.	£626	18	2
F. Donne, Devonport*	608	15	1

DEVONPORT.—For levelling, paving, and completing lane between St. George's-terrace, St. George's-road, and Pasley-street (section 2), for the Corporation. Mr. J. F. Burns, Borough Surveyor, Municipal Offices, 29, Ker-street, Devonport:—

F. Donne	£427	4	9
Jefford & Sons	410	11	0
E. L. P. Duke	399	1	4
Pethick Bros.	£394	19	0
T. Doney, Plymouth*	391	3	6

EAST BARNET.—For making-up road and tar-paving footways, Long-street, for the East Barnet Valley Urban District Council. Mr. H. York, Surveyor, Council Offices, Station-road, New Barnet:—
T. Adams, Wood Green, N. £770

EMYVALE (Monaghan).—For erecting a dispensary and dispensary residence, etc. (stonework), for the Guardians of Monaghan Union. Mr. W. A. Scott, architect, 74, Hollybank-road, Drumcondra, Dublin:—

McKee & McNally	£1,325	0	0
J. Callan	1,220	0	0
H. McCann & Sons	1,040	0	0
T. Duffy	£1,035	0	0
H. McGeough, Monaghan*	924	18	9

FARNHAM.—For alterations and additions, etc., to Badshot Lea Council School, Farnham, for the Surrey Education Committee. Messrs. Jarvis & Richards, architects, 36, Victoria-street, London, S.W.:—

A. Mardon	£1,461	2	2
East & Hyde	1,290	5	0
McC. E. Fitt	1,213	0	0
Crosby & Co.	1,177	0	0
Drowley & Co.	1,174	17	10
P. Caesar	1,174	0	0
E. C. Hughes	£1,158	12	5
Tompsett & Co.	1,118	0	0
Martin, Wells, & Co.	1,047	0	0
G. Kemp*	942	0	0

FARNHAM.—For alterations and additions, etc., to Hale Council School, Farnham, for the Surrey Education Committee. Messrs. Jarvis & Richards, architects, 36, Victoria-street, London, S.W.:—

Moss & Co.	£1,117	16	0
Drowley & Co.	942	18	11
East & Hyde	905	17	0
Higgs & Outhwaite	891	0	0
A. Mardon	819	19	0
Stimson & Sons	792	3	6
E. C. Hughes	770	5	9
Tompsett & Co.	£770	0	0
McC. E. Fitt	752	0	0
Crosby & Co.	696	0	0
P. Caesar	670	0	0
G. Kemp	667	0	0
Martin, Wells, & Co.	660	0	0

FELTHAM.—For alterations at the Town Hall, for the Middlesex County Council. Mr. H. T. Wakelam, County Architect, Middlesex Guildhall, S.W. Quantities by Messrs. Young & Brown, Holborn:—

W. Slark	£2,106		
G. Parker	1,875		
W. R. & A. Hide	1,863		
Patman & Fotheringham, Ltd.	1,853		
Spiers & Son	1,839		
D. D. Heath	1,830		
T. Hiscock	1,799		
C. Ansell	1,781		
T. W. Soole & Son	1,750		
J. C. Mather	1,745		
J. H. Baker & Co., Ltd.	£1,724		
G. Godson & Sons	1,693		
Wisdom Bros.	1,608		
Dorey & Co., Ltd.	1,603		
A. Emmett	1,595		
T. J. Messom & Sons	1,589		
J. Hebblethwaite	1,514		
W. H. Hyde, Norwood Junction*	1,444		

GORSEINON.—For erecting an institute in Lime-street, for the Gorseinon and District Trades and Labour Council. Mr. C. T. Ruthen, architect, Bank-chambers, Heathfield-street, Swansea:—

T. D. Jones	£1,995	H. Billings	£1,760
D. Jenkins	1,779	G. Mercer, Llanelly*	1,710

HINDHEAD.—For new Council school, Hindhead, for the Surrey Education Committee. Messrs. Jarvis & Richards, architects, 36, Victoria-street, London, S.W.:—

Willcock & Co.	£4,375	11	0
Crosby & Co.	4,150	0	0
Johnson & Co.	4,118	0	0
Jenkins & Sons	4,077	0	0
F. Milton	4,022	0	0
Martin Wells & Co.	4,000	0	0
Chapman & Lowry	3,931	0	0
G. Kemp	3,875	0	0
Haslemere Builders, Ltd.	3,857	3	0
R. Elvy	3,833	12	0
H. Kent	£3,824	0	0
Norman & Burt	3,799	0	0
W. J. Renshaw	3,791	0	0
Enness Bros.	3,783	0	0
Hawkins & Co.	3,765	4	8
East & Hyde	3,731	0	0
J. & N. Patrick	3,709	0	0
Moss & Co.	3,670	12	6
J. J. Shopland	3,668	0	0
W. H. Hyde	3,645	10	0
H. Flint†	3,542	0	0

KNAPHILL.—For alterations and additions to mixed school, new infants' school, manual instruction and cookery room, Knaphill Council Schools, for the Surrey Education Committee. Messrs. Jarvis & Richards, architects, 36, Victoria-street, London, S.W.:—

Aylott	£8,169	2	1
Chinchen & Co.	7,711	15	5
Sycamore Works, Ltd.	7 647	16	10
J. Shepherd	7,511	0	0
Bunning	7,368	15	9
Higgs & Outhwaite	7,286	0	0
Martin Wells & Co.	7,233	0	0
Gammon	7,185	14	10
Mitchell Bros.	7,169	0	0
Enness Bros.	7,121	9	0
F. J. Shopland	7,116	0	0
Hart	£7,035	2	11
W. H. Hyde	7,022	0	0
E. Streather	6,972	19	0
F. Deacon	6,959	3	0
Drowley & Co.	6,951	9	10
Banyard	6,920	0	0
East & Hyde	6,901	0	0
Cropley & Son	6,736	0	0
Turtle & Appleton	6,580	0	0
J. & N. Patrick	6,464	0	0
W. Watson	6,427	0	0
H. Kent	6,309	0	0
W. W. Gale†	6,266	18	7

LEICESTER.—For Belgrave sewerage (No. 4 contract), 1,271 yds. of brick and pipe sewers, for the Corporation. Mr. E. G. Mawbey, Borough Surveyor, Town Hall, Leicester:—

O. Wright & Co.	£6,956	9	0
W. Moss & Sons, Ltd.	6,042	6	6
G. Mackay & Sons	4,938	4	0
Langley, Hardy, & Johnson	4,301	12	0
Bentley & Lock	£4,247	2	8
Philbrick Bros.	4,175	2	5
Smedley & Booth	4,144	1	0
Johnson & Langley, Leicester*	4,120	11	9

GREENWICH.—For paving margins of roadway, Blackwall-lane and Tunnel-avenue, for the Greenwich Borough Council:—

Approximate Quantities.	Schedule.	Harvey Bros.	G. J. Anderson, 26, North-street, Poplar.*	Dick, Kerr, & Co., Ltd.	J. Mowlem & Co., Ltd.	W. Griffiths & Co., Ltd.	J. Shelbourne & Co.
	Taking up, cleaning, redressing where required, and relaying 12-in. by 8-in. granite channel kerb, on concrete feeding, at per ft. lineal	s. d. 0 5½	s. d. 0 6	s. d. 0 10	s. d. 0 6	s. d. 0 8	£ s. d. 0 0 4
9,000 yds. super.	Supplying and delivering, laying, grouting, including concrete and all necessary works complete, new 3-in. by 6-in. Aberdeen granite setts, at per yd. super.	16 6	16 9	18 4½	18 8	19 6	1 0 0
2,000 yds. super.	Supplying and delivering all as before, on works, new 3-in. by 6-in. Inverkeithing setts only, at per yd. super.	10 3	13 6	14 9½	16 1	17 0	0 16 9
	Supplying and laying concrete and all works complete, hardwood paving blocks, 3 in. by 9 in. by 5 in. at per yd. super. (Jarrah)	17 5	16 6	17 11½	16 6	16 10	0 18 8

LERWICK.—For 150 9-ft. lengths of 4-in. cast-iron water pipes and 50 lengths spigot and faucet, etc., for the Town Council. Mr. G. Cruikshank, Borough Surveyor, Lerwick :—

Cameron & Robertson, Kirkintilloch .. £99 7 1

LEYTON.—For erecting 1,000 lineal yds. of fencing on marsh lands adjoining Lea Bridge, for the Urban District Council. Mr. W. Dawson, Surveyor, Town Hall, Leyton, E. :—

E. A. Russell..	£283 6 8	J. Ruggles	£187 10 0
J. Barnes & Sons	225 0 0	Horton & Son	183 6 8
E. Frost	225 0 0	W. Manders ..	183 6 8
R. N. Marrable	225 0 0	M. Marshall ..	175 0 0
A. Stevens	216 13 4	Rowland Bros.	165 12 6
T. Torode	216 0 0	A. Turner & Sons	164 11 8
E. C. White ..	212 10 0	P. H. Allin & Son, Cambridge*	135 0 0
G. Hebburn ..	208 6 8		
J. Jackson	200 0 0		
W. Thomas ..	191 13 4		

LEYTON.—For paving, channelling, etc., certain public streets, for the Urban District Council. Mr. W. Dawson, Surveyor. Town Hall, Leyton, E. :—

T. Adams ..	£1,667 9 2	J. E. Hanson & A. Waterhouse	£1,521 17 1
W. Griffiths & Co., Ltd.	1,660 2 7	W. Manders..	1,474 17 6
T. Free & Sons	1,595 0 0	G. J. Anderson	1,470 9 2
J. Jackson ..	1,559 10 0	O. T. Gibbins, Leytonstone*	1,441 0 0
Hewett & Sons	1,558 17 6		

LONDON.—For making-up the carriageway of Chipstead-street, Fulham, for the Fulham Borough Council. Mr. F. Wood, Borough Surveyor, Town Hall, Fulham, S.W. :—

	Roadway. £ s. d.		Footway. £
Harvey Bros.....	1,304 0 9	....	—
H. J. Greenham....	979 0 0	....	—
J. Mears	970 0 0	....	—
G. W. Wimpey & Co.	944 0 0	....	—
F. Fowles*	805 0 0	....	—
Borough Surveyor..	—	....	260

LONDON BOARD OF EDUCATION TENDERS.

The exterior of the undermentioned schools are due, in accordance with the rule, to be painted during 1905, and tenders for the work have been received as follows :—

Battersea, "Latchmere," (JM).

Lapthorne & Co...	£58 16	J. Garrett & Son..	£45 0
E. B. Tucker	47 0	R. S. Ronald	42 0
L. Whitehead & Co., Ltd.	45 0	Rice & Son, 15, Stockwell-road*.	41 0

Bermondsey, Monnow-road (old portion).

T. G. Sharpington ..	£273	W. H. King	£203
H. Line.....	231	J. Garrett & Son....	190
W. H. Lascelles & Co.....	215	H. Groves.....	175
Rice & Son	203	W. Sayer & Son, 86, New Kent-road*..	165

Bethnal Green, N.E., Mowlem-street.

A. E. Symes ..	£320 0 0	H. Bouneau ..	£238 12 6
Vigor & Co. ..	280 0 0	W. Silk & Son	232 10 0
H. Willmott ..	265 0 0	Barrett & Power	215 0 0
W. Shurmur & Sons, Ltd. ..	264 0 0	R. Woollaston & Co., 22, Lacey-street, Bow*.	197 0 0
J. Haydon & Sons	240 0 0		

Bow and Bromley, "Old Palace."

A. W. Derby	£181 0	Langdon & Clark	£98 0
A. E. Symes	120 0	J. Dolman & Co., Ellerthorpe-street, Poplar*	93 0
R. Woollaston & Co.	99 10		

Brixton, Stockwell-road.

J. W. Leonard.....	£225	Holliday & Greenwood, Ltd.	£149
W. Read	174	W. Smith & Son....	145
L. Whitehead & Co. Ltd.	165	Maxwell Bros., Ltd..	143
W. J. Coleman & Co.	162	J. J. Richards.....	138
Rice & Son	159	E. Triggs, 92, The Chase, Clapham*..	134

Deptford, Clifton-road.

H. L. Holloway..	£273 0	S. Musgrove	£183 3
W. J. Howie	228 0	W. Young, 1, Apsley-road, South Norwood*	183 0
W. Hayter & Son	212 10		
W. V. Goad	200 0		

Dulwich, "Friern."

H. Line	£177 0	C. G. Jones	£119 18
T. G. Sharpington	163 0	Maxwell Bros., Ltd., 310, Brixton-road*	119 0
Crabb & Son	154 0		
Grace & Marsh ..	146 0		
J. & C. Bowyer ..	128 0		

Dulwich, Goodrich-road.

H. Leney & Son	£325 0 0	J. & C. Bowyer	£212 10 0
T. G. Sharpington	275 0 0	W. J. Mitchell & Son	204 0 0
J. W. Leonard	245 17 8	W. V. Goad, 241, Camberwell-road* ..	179 0 0
Crabb & Son ..	230 0 0		
Grace & Marsh	220 0 0		

Finsbury, C., Compton-street.

J. Stewart	£225 15	Langdon & Clark	£169 0
W. Reason.....	210 10	J. Grover & Son, Wilton Works, Islington*	147 0
W. H. Lascelles & Co.	189 0		

Finsbury, C., "Hugh Myddelton" (Junior).

H. Bouneau	£180 0	Marchant & Hirst	£106 0
W. H. Lascelles & Co.	150 0	J. Grover & Son, Wilton Works, Islington*	98 0
W. Reason.....	125 10		
Barrett & Power .	110 10		

Finsbury, C., St. John's-lane.

J. Barton & Co...	£174 0	J. Chessum & Sons	£98 0
W. Reason.....	136 0	Mattock & Parsons, 165, Gray's Inn-road*	86 0
Killby & Gayford	115 0		
G. S. S. Williams & Son	111 10		

Fulham, Ackmar-road.

Lole & Co.	£377 0	C. Johnson.....	£274 10
Bristow & Eatwell	327 0	J. Peattie, 18, Dorset-street, Baker-stree* ..	208 0
Lathey Bros....	297 0		
F. Chidley & Co., Ltd.....	292 10		

Greenwich, Blackheath-road.

H. L. Holloway..	£207 0	W. J. Howie	£141 0
P. S. Howard ..	205 0	S. Musgrove, 90, Amersham-vale, New Cross* ..	138 19
W. Hayter & Son	195 10		
H. Groves	170 0		
C. G. Jones	165 11		

Greenwich, Fossdene-road.

H. Groves	£165 0 0	J. Scott Fenn .	£145 15 0
W. Banks	164 17 6	W. Hayter & Son	139 10 0
R. Woollaston & Co.	156 0 0	P. S. Howard, 25, Churchlane, Charlton*	109 10 0
W. J. Howie ..	155 0 0		
E. Proctor & Son	149 0 0		

Greenwich, Glenister-road.

P. S. Howard	£210 0 0	S. Musgrove ..	£142 10 0
W. Banks	174 19 6	J. Scott Fenn	139 10 0
R. Woollaston & Co.	146 10 0	H. Groves, Stockwell-st., Greenwich*..	139 10 0
W. J. Howie ..	144 0 0		

Hackney, N., Bailey's-lane.

H. Willmott.....	£155	Barrett & Power....	£108
J. Stewart	137	Woollaston Bros., 22, Rockmead-road, South Hackney* ..	84
W. Silk & Son.....	129		
R. Woollaston & Co.	121		

Hackney, N., Benthal-road.

Patman & Fotheringham, Ltd...	£213 0	Woollaston Bros.	£155 0
J. Chessum & Sons	199 0	Barrett & Power	135 0
J. Stewart	160 0	W. Silk & Son, 13, High-street, Homerton*....	132 10
C. R. Price.....	155 10		

Islington, E., Gillespie-road.

A. Porter	£194 0	G. S. S. Williams & Son	£163 10
McCormick & Sons	188 0	Steven Bros.	154 10
Patman & Fotheringham, Ltd..	176 0	F. W. Harris & Co., Ltd., Albion Works, Barnsbury*	137 0
G. Kirby.....	169 0		
J. Stewart	167 0		

Islington, E., Shepperton-road.

F. W. Harris & Co., Ltd.....	£165 0	Barrett & Power	£136 0
Killby & Gayford	159 10	Patman & Fotheringham, Ltd. ..	129 0
J. Chessum & Sons	157 0	J. Grover & Son, Wilton Works, Islington*	119 0
A. Porter	153 0		
W. King & Son ..	140 0		

Islington, N., Montem-street (SM).

McCormick & Sons	£83 0	W. Chappell, 243, Elgin-avenue, Maida-vale*	£62 6
G. Kirby.....	81 0		
Steven Bros.	74 0		

Islington, S., Queen's Head-street.

J. Barton & Co.	£260 0 0	F. W. Harris & Co., Ltd. ..	£137 0 0
J. Chessum & Sons.....	159 0 0	J. Grover & Son	133 0 0
A. Porter	144 0 0	Patman & Fotheringham, Ltd., Parkstreet, Islington*	133 0 0
McCormick & Sons	141 0 0		
W. Silk & Son	138 10 0		

Islington, W., Hungerford-road.

G. Kirby.....	£151 0 0	W. Chappell ..	£125 0 0
J. Peattie	145 0 0	W. Densham & Sons, 17, Circus-road, St. John's Wood*	98 10 0
Stevens Bros. ..	136 0 0		
Marchant & Hirst	136 0 0		

Kensington, N., Middle-row.

G. H. Sealy	£290 0	J. Peattie	£127 0
Bristow & Eatwell	183 10	Chinchen & Co..	124 10
J. M. French & Co.	146 5	W. Chappell, 243, Elgin-avenue, Maida Vale* ..	95 0
General Builders, Ltd.....	144 0		

Kensington, N., Wornington-road.

G. H. Sealy ..	£467 10 0	C. Johnson....	£215 10 0
General Builders, Ltd.	298 0 0	W. Brown & sons.....	196 3 6
Cowley & Drake	285 0 0	W. Chappell, 243, Elgin-av., Maida Vale*..	195 0 0
Aldridge & Son	260 0 0		
G. Neal	242 0 0		
Chinchen & Co.	229 10 0		

Kensington, S., Gloucester-grove East.

E. Flood.....	£238 0 0	F. Chidley & Co., Ltd.....	£165 0 0
Spencer, Santo, & Co., Ltd...	183 0 0	Lole & Co., Trafalgar-square, Chelsea*	135 0 0
W. Brown & Sons.....	171 15 8		

Limehouse, Broad-street.

H. Bouneau	£275 0	Vigor & Co.	£238 0
Barrett & Power	263 0	Langdon & Clark, 3, Grosvenor-road, Ilford* ..	234 0
A. W. Derby	261 0		
J. Haydon & Sons	240 12		

Poplar, "Bow Creek."

A. E. Symes	£74	J. Dolman & Co., 1, Ellerthorpe-street, Poplar*	£47
A. W. Derby	74		
Vigor & Co.	70		
R. Woollaston & Co...	62		

Rotherhithe, Farncombe-street.

H. Line	£185 0	Holliday & Greenwood, Ltd.....	£133 0
W. H. Lascelles & Co.	157 0	H. Groves	127 10
W. H. King	151 10	Maxwell Bros., Ltd., 310, Brixton-road*	124 0
W. Sayer & Son	134 0		

Rotherhithe, "Southwark-park."

H. Line.....	£235	W. Sayer & Son	£149
W. H. King.....	172	E. Triggs, 92, The Chase, Clapham*..	144
Staines & Son	164		
J. Greenwood, Ltd...	158		

St. Pancras, E., Aldenham-street.

J. Barton & Co.	£346	J. Peattie	£123
T. Cruwys	160	Mattock & Parsons..	109
W. Hornett	145	Marchant & Hirst, 136, Highgate-road	103
W. H. Lascelles & Co.	140		

St. Pancras, W., Haverstock-hill.

Cowley & Drake	£337 0	Marchant & Hirst	£134 0
T. Cruwys	184 10	W. Densham & Sons, 17, Circus-road*	122 0
G. Neal	189 0		
Chinchen & Co..	169 0		
General Builders, Ltd.....	147 0		

Southwark, W., Hatfield-street.

W. Hornett	£227	E. Triggs	£154
G. Brittain	189	J. R. Sims, 58, Horseferry-road, Westminster*	132
J. Appleby & Sons ..	187		
W. Sayer & Son	177		
J. F. Ford	173		

Southwark, W., Westminster Bridge-road.

W. King & Son..	£219 0	Holloway Bros. (London), Ltd.	£140 0
L. Whitehead & Co., Ltd.....	166 0	J. R. Sims	123 10
G. Brittain.....	157 0	Rice & Son, 15, Stockwell-road*	119 0
J. Appleby & Sons	153 0		
W. Sayer & Son	142 10		

Wandsworth, Fircroft-road.

W. Johnson & Co., Ltd.	£159	J. Garrett & Son ..	£142
R. S. Ronald	150	Lathey Bros.	128
Martin, Wells, & Co., Ltd.	150	E. B. Tucker, 82, Lavender-hill*....	123

Wandsworth, Merton-road.

R. A. Jewell	£184	C. Leather & Sons ..	£132
J. Carmichael	181	E. B. Tucker, 82, Lavender-hill*....	109
R. S. Ronald	170		
Hudson Bros.	155		

Whitechapel, Buck's-row.

A. W. Derby	£141	Vigor & Co.....	£111
W. H. Lascelles & Co.	140	J. Haydon & Sons, Teesdale-street, Hackney-road* ..	90
J. F. Holliday	138		
J. Dolman & Co.....	127		
W. Hornett	122		

Whitechapel, Deal-street.

A. E. Symes	£194 0	Woollaston Bros...	£119 0
A. W. Derby	166 0	J. Haydon & Sons	116 8
J. Dolman & Co...	138 0	R. Woollaston & Co., 22, Lacey-street, Bow*....	112 0
Vigor & Co.	134 0		
Steven Bros.	124 0		

Woolwich, "Maryon-park."

W. Banks	£127 0	W. J. Howie	£104 0
H. Groves	125 0	J. Scott Fenn, 42, William-street, Woolwich*	99 18
W. Hayter & Son	124 10		
E. Proctor & Son	114 0		
P. S. Howard ..	114 0		

Chelsea, The "Ashburnham" (Reconstructing Portion of Drains).

R. P. Beattie	£620	Davey & Roberts ..	£521
Durbin & Katesmark	595	L. Whitehead & Co., Ltd., Portland-place North, Clapham-road*	519
G. Neal	581		
Lathey Bros.	555		
J. Peattie	545		
F. Bull	526		

Wandsworth, Mitcham-lane Site (Iron Buildings).

Croggon & Co., Ltd.	£1,230	F. Smith & Co. ..	£1,071
Mitson & Harrison	1,200	R. Ilea, Ltd.....	1,043
Humphrey's, Ltd...	1,200	A. Leather, Riverbank Works, Wandsworth* ..	929
T. J. Hawkins & Co.	1,149		
W. Harbrow.....	1,120		
J. McManus	1,094		

Bethnal Green, N.E., Bonner-street (Covered Playground).

W. Martin	£109 0	A. E. Symes	£94 0
Vigor & Co.	105 0	Barrett & Power	94 0
W. H. Lascelles & Co.	96 10	J. T. Robey	93 0
W. Shurmur & Sons, Ltd.	94 5	J. Grover & Son, Wilton Works, Islington*	84 0

Hackney, S., Daubeney-road (Division of Rooms).

G. S. S. Williams & Son	£212 0	W. Shurmur & Sons, Ltd.	£189 0
W. H. Lascelles & Co.	207 0	Stevens Bros.....	171 0
L. H. & R. Roberts	205 0	J. Grover & Son, Wilton Works, Islington*	162 0
H. Bouneau	196 10		

Hackney, S., Morning-lane (Provision of Porch).

H. Willmott	£116 10	W. Shurmur & Sons, Ltd., Riverside Works, Upper Clapton*	£90 0
W. H. Lascelles & Co.	101 10		
J. Grover & Son .	98 0		
Stevens Bros. ..	97 10		

Hoxton, Shoreditch Technical Institute.

G. S. S. Williams & Son.....	£444 0	McCormick & Sons	£257 5
L. H. & R. Roberts	399 0	J. Grover & Sons	244 0
E. Lawrance & Sons	330 0	A. E. Symes, Carpenter's-road, Stratford*	242 0
T. L. Green	327 0		
W. H. Lascelles & Co.....	299 0		

Limehouse, Thomas-street (Additional Room for Teachers).

Vigor & Co.	£110	J. T. Robey	£87
Langdon & Clark ..	98	A. E. Symes, Carpenter's-road, Stratford*	74
Barrett & Power....	97		

Rotherhithe, Midway-place (Relaying Floor and Removing Babies' Gallery).

Acme Flooring and Paving Co. (1904), Ltd.	£232	Holliday & Greenwood, Ltd.	£149
Lathey Bros.	169	Vigor & Co.....	145
E. Triggs	163	J. T. Robey.....	135
J. Garrett & Son....	161	W. H. Lascelles & Co., 121, Bunhill-row*	120
Barrett & Power....	152		
J. Marsland & Sons	149		

Hackney, N., Oldfield-road (Heating Apparatus).

W. G. Cannon & Sons	£58 0	G. & E. Bradley..	£40 0
C. Kite & Co.	55 0	Stevens & Sons ..	36 0
Brightside Foundry & Engineering Co., Ltd.	45 10	Wontner-Smith, Gray, & Co., 81, Finsbury-pavement*	32 10

Islington, S., Richard-street (New Boilers and Heating Apparatus).

C. Kite & Co.	£346 0
G. Davis	340 0
Brightside Foundry & Engineering Company, Ltd.....	327 15
J. Grundy	305 0
Comyn, Ching, & Co., Ltd.	290 0
W. G. Cannon & Sons, 107, London-road, Southwark*.....	285 0

Kensington, N., Portobello-road (Improvements).

[That the cloakroom and the teachers' room of the girls' department of the Portobello-road school (Kensington, N.) be enlarged, and that a stock cupboard be provided; that expenditure not exceeding 280*l.* be sanctioned for this purpose; that the work be executed by Messrs. J. & M. Patrick, the contractors for improvements at the school; and that the actual cost be calculated, on completion, on their contract schedule of prices.]

Anerley Residential School (Extension of Playing Field).

W. Taylor (two estimates)	£147 0 124 0	J. Power, 1, Madeleine-road,	
A. Thoburn	75 0	Anerley, S.E.* .	£73 10

TENDERS.—*Continued on Page 169.*

CONTRACTS AND PUBLIC APPOINTMENT.

(For some Contracts, etc., still open, but not included in this List, see previous issues.)

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, etc., supplied by	Tenders to be Delivered
Langbank Sewage Works	Renfrew Lower District Committee	J. Murray, C.E., County Buildings, Paisley	Aug. 7
Paving and Flagging Streets	Leeds Corporation	City Engineer's Office, Municipal Buildings, Leeds	Aug. 8
Tar Macadam Carriageways	do.	do.	do.
Masons' and Painters' Work at Scattered Homes	Plymouth Guardians	W. Adams, 13, Princess-square, Plymouth	do.
New Street at Parc Main, Carmarthen	Carmarthen Corporation	Borough Surveyor's Office, John-street, Carmarthen	do.
Laying 1,800 yds. of 5-in. Cast-Iron Mains	Cranleigh Water Co., Ltd.	F. S. Courtney, Engineer, 25, Victoria-street, Westminster, S.W.	do.
Removal of 1,250 yds. of 4-in. and 3-in. Mains	do.	do.	do.
Macadam and Concrete Paving	Edinburgh City Council	Mr. Proudfoot, City Road Surveyor, City-chambers, Edinburgh	do.
Sanatorium Water Supply, Barrasford	.....	A. S. Dinning, 21, Ellison-place, Newcastle-on-Tyne	do.
Granite	Newhaven U.D.C.	E. Knightley, Clerk, Council Offices, Newhaven, Sussex	do.
Sewers	Chiswick U.D.C.	J. Barclay, Surveyor, Town Hall, Chiswick	do.
Cupboards, Desks, Lockers, etc., at Technical School	Plymouth Education Authority	E. Chandler Cook, 18, Princess-square, Plymouth	Aug. 9
Single and Dual Desks	do.	do.	do.
4 Hses. & Shp., Spring-gds., Burnley-rd., Sowerby Bdg. Road, Druncrow	.....	H. Thompson, Architect, Post Office-chambers, Elland	do.
Cutting Hills	Larne R.D.C.	County Surveyor, County Courthouse, Belfast	do.
Works, Boiler House, etc., Wapping, Bradford	do.	do.	do.
Three Shops, New Bridge-street, Newcastle	Woolcombers, Ltd.	P. Turner, Architect, 12, Midland-buildings, Bradford	do.
Rolled Material for Waggons	North-Eastern Railway Co.	W. Bell, Architect, Central Station, Newcastle-on-Tyne	do.
Electric Travelling Cranes	Secretary of State for India	Director-General of Stores, India Office, Whitehall	do.
Sinking and Walling Shaft	do.	do.	do.
Granite Kerb	Dulais Anthracite Collieries Co.	Morgan W. Davies, Mining Engineer, Swansea	do.
Stone Paving for Footways	Edmonton U.D.C.	G. Eedes Eachus, Engineer, Town Hall, Edmonton	do.
Caledonian Bank Buildings, Buckie	do.	do.	do.
*STABLING AT THAMES DITTON	.....	Ross & Macbeth, Architects, Queensgate-chambers, Inverness	do.
Cemetery, Penyrheol	Assoc. of Trotting Horse Owners, Ld.	Pound Farm, Esher, Surrey	do.
Two Houses, Burley-in-Wharfedale	Caerphilly U.D.C.	A. O. Harpur, Surveyor, Council Offices, Caerphilly	Aug. 10
Painting & Decorating South End Prov. Sch., Eliand	.....	Milne & France, Architects, 99, Swan-arcade, Bradford	do.
Additions, etc., to Royal Hotel, Rhymney	West Riding Education Committee	J. Vickers-Edwards, County Architect, County Hall, Wakefield	do.
Iron Sur. Wa. Drn. Pps., etc., "The Rest," Porthcawl	Messrs. Buchan & Co.	T. Roderick, Architect, Aberdare	Aug. 11
Restoration of St. Leonard's Church, Malton	.....	A. Williams, Secretary, "The Rest" Committee, Porthcawl	do.
Alterations, etc., Fowey Grammar School	.....	C. H. Channon, Architect, Malton	Aug. 12
Millport Waterworks	The Governors	The Headmaster	do.
Nonslip Granite Setts	Millport Town Council	Niven & Haddin, C.E., 131, West Regent-street, Glasgow	do.
Laying-out Burial Ground at Holmer	Luddenden Foot U.D.C.	J. S. Bottomley, Surveyor, Council Offices, Luddenden Foot	do.
Steam-tipping Lurry	Holmer Parish Council	Haywood & Sons, Hereford	do.
Alterations, etc., of Addoldy Chapel, Glyn-Neath	Newton-in-Makerfield U.D.C.	A. Bowes, Gas Engineer, Town Hall, Earlestown, Lancs.	do.
Eleven Houses at Lock-street, Abercynon	Building Committee	J. Cook Rees, Architects, Neath	Aug. 14
Library, Church Village, Llantwitfardre	Taff Building Club	W. Dowdeswell, Architect, Treharris	do.
Sewage Disposal Works, Red-row, near Chevington	Llantwitfardre Parish Council	A. Lloyd Thomas, Engr. and Arch., Church-st.-chbrs., Pontypridd	do.
*SCHOOL AT MAYBURY	Morpeth R.D.C.	A. Adams, 14, Market-place, Morpeth	do.
Alterations to Farm Buildings, Baldwinholme	Surrey Education Committee	Jarvis& Richards, Architects, 36, Victoria-street, Westminster, S.W.	do.
Stabling at Depot, Ley-street, Ilford	Mr. N. B. Thompson	G. Armstrong, Architect, 24, Bank-street, Carlisle	do.
*ELECTRICITY WORKS—SUB-STATION	Ilford U.D.C.	H. Shaw, Surveyor, Town Hall, Ilford	do.
Seven or Eight Cottages at Senghenydd	Finchley U.D.C.	Electrical Engineer, Electricity Works, Finchley, N.	do.
Nine Houses, Blaenogwr, Nantymoel	Lewis-Merthyr Colliery Co.	J. H. Phillips, Architect, Clive-chambers, Windsor-place, Cardiff	Aug. 15
School, King Edward-street, Middlewich	.....	J. Jones, 35, Dinam-street, Nantymoel	do.
School for Defective Children	Chester Sub.-Com. for Winsford, etc.	J. Cawley, Architect, Bull-ring, Norwich	do.
Alterations to Premises, Luther-street, Speedwell-st.	Oxford Education Committee	Estate Surveyor's Office, Town Hall, Oxford	do.
Alters. & Repairs & Bldg. Classroom, Sudbury Schl.	do.	do.	do.
Schools, etc., Westminster-road, Handsworth	West Suffolk Education Committee	Office of Committee, 5, Crown-street, Bury St. Edmunds	do.
Heating and Ventilating Schools, Westminster-road	Handsworth U.D.C.	J. P. Osborne, Architect, 95, Colmore-row, Birmingham	do.
Sinking a Borehole	do.	do.	do.
Automatic Recorder and Switch, at Sewage Chamber	Clare R.D.C.	Sands & Walker, Engineers, Milton-chbrs., Milton-st. Nottingham	Aug. 16
*NEW BOILER HOUSE, ETC.	Blackpool Corporation	J. S. Brodie, Borough Engineer, Town Hall, Blackpool	do.
*CLINKER RIDDLING PREMISES	Metropolitan Borough of Fulham	Borough Engineer, Town Hall, Fulham	do.
*PAINTING, ETC., WORK AT TOWN HALL	do.	do.	do.
Primitive Methodist Church, Kettering	Hammersmith Borough Council	Borough Surveyor, Town Hall, Hammersmith, W.	do.
*STREET WORKS, FITZJOHN'S-AVENUE	.....	T. A. Buttery & S. B. Birds, Architects, Queen-street, Morley	Aug. 17
Works at Glass Houghton Cutsyke School	Barnet U.D.C.	Council's Surveyor, 40, High-street, Barnet	Aug. 19
Works at Denby Dale School	West Riding Education Committee	J. Vickers-Edwards, County Architect, County Hall, Wakefield	do.
Two Suction Gas Plants and Alterations to Engines	do.	do.	do.
New Engines and Offers for Existing Ones	Pembroke Borough Council	R. D. Lowless, Town Clerk, Pembroke	do.
Embankment, etc., for Reservoir, Embsay Beck	do.	do.	do.
*NEW SCHOOL AT EYNSFORD, CROCKENHILL	Skipton U.D.C.	G. H. Hill & Sons, Engineers, 3, Victoria-st., Westminster, S.W.	Aug. 21
*RECON. SCOTS HILL BDGE., RICKMANSW'TH	Kent Education Committee	W. Harston, Architect, 8, Hythe-street, Dartford	do.
Sewers, etc. (Contract 13)	Herts C.C.	County Surveyor, County Surveyor's Office, Hatfield	do.
*FOUNDS., NEW UNIV. COLL. BLDGS., CARDIFF	Chadderton U.D.C.	J. Diggle & Son, Engrs., Hind Hill-st., Heywood & Westminster	Aug. 22
Boys' School, Pontshonorton	Univ. Coll. of South Wales and Mon.	W. D. Caröe, Architect, 8A, Whitehall-place, S.W.	do.
*HOME FOR AGED POOR	Pontypridd U.D.C.	P. R. A. Willoughby, Surveyor, Pontypridd	Aug. 23
Fire Brigade Station, Baths, etc., Manor House Estate	Parish of Lambeth	Clerk to the Guardians, Guardians' Offs., Brook-st., Kennington, S.E.	do.
*RDS. & SEWERS, MANOR ESTATE, LR. TOOTING	Shipley U.D.C.	W. H. Beevers, Architect, 26, Bond-street, Leeds	do.
Works at Kedington Workhouse, Suffolk	.....	H. R. G. S. Smallman, Architect, 8, Queen-street, Cheapside, E.C.	do.
WARD BLOCK, MUSWELL-HILL ISOLA. HOS.	Risbridge Guardians	F. J. Smith, Architect, Parliament-mansions, Victoria-street, S.W.	Aug. 24
*MAK.-UP FRANCIS, ETC., RDS., & SOUTHW'D-AV.	Borough of Hornsey	Borough Engineer, Municipal Offices, Southwood-lane, Highgate	do.
Duplicate Pumping Machinery (Contract No. 6)	do.	do.	do.
*NEW ELEMENTARY SCHOOL, E. FINCHLEY, N.	Selby U.D.C.	Percy Griffith, Engineer, 54, Parliament-street, Westminster, S.W.	Aug. 28
Dry Dock Pumping Machinery, Avonmouth	Finchley U.D.C.	W. G. Wilson, Architect, 5, Bloomsbury-mansions, W.C.	Sept. 1
*CONSTRUCT. NEW DOCK, ETC., IMMINGHAM	Bristol Docks Committee	W. W. Squire, Engineer, Cumberland-road, Bristol	Sept. 11
*NEW ELEMENTARY SCHOOLS, AYLESBURY	Humber Com. Ry. & Dock Co. Dcrs.	Sir J. Wolfe Barry & Partners, 21, Delahay-st., Westminster, S.W.	Sept. 20
Residence at Cottingham	Bucks Education Committee	J. M. & H. Kennard, Archs., 13, Railway-approach, London Bdge.	do.
Primitive Methodist Church, Sunnybrow, Wellington	Mr. R. Kitching	T. B. Thompson, Architect, 15, Parliament-street, Hull	No date.
Primitive Methodist Ch., Dene Bridge, near Ferryhill	.....	Davidson & Phillipson, Pearl-buildings, Newcastle-on-Tyne	do.
Widening Road between Ecclesfield and Chapeltown	.....	do.	do.
Painting, etc., Benn Ulster Eye Hos., Clifton-st., Belfast	Wortley R.D.C.	F. Crawshaw, Surveyor, Loxley	do.
Painting and Repairs, Barkisland Endowed School	.....	H. Leaver, Architect, 22, Donegall-place, Belfast	do.
Hot-water Heating Apparatus, Flockton Parish Ch.	.....	The Managers, Barkisland	do.
Repaint., etc., Iron Hd. Gr., Trench Pit, Garforth Col.	.....	The Vicar of Flockton	do.
Water Supply, Little Lempston, near Totnes	.....	R. Routledge, Manager, Garforth Colliery, near Leeds	do.
Alters. to Shop Premises, 15, Commercial-st., Leeds	.....	Bourne & Son, Land Agents, Totnes	do.
Road, 700 yds. long, at Old Colwyn	.....	A. E. Braithwaite, 21, Victoria-road, Hyde Park, Leeds	do.
Repointing, etc., 213A, Barking-rd., Canning Town, E.	.....	Mrs. Mellor, Gorphwysfa, Old Colwyn	do.
	.....	F. Holbrook, Secretary	do.

PUBLIC APPOINTMENT.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
*CLERK OF WORKS	Corporation of London	4l. 4s. per week	Aug. 17

Those marked with an asterisk (*) are advertised in this number. *Competitions*, —. *Contracts*, lv. vi. viii. x. *Public Appointments*, xix.

TENDERS.—*Continued from page* 167.

LONDON.—For painting works for residences of employees of the Westminster City Council :—

T. Coulthard....	£166 0	Love & Co.....	£126 15
W. Day & Son ..	144 0	J. Roberts	119 0
T. W. Haylock ..	135 0	J. R. Sims*.....	104 0

LONDON.—For the reconstruction of four bridges carrying the Albert Embankment-road over certain dock entrances, and for the reconstruction of Mill Pond Bridge in Nine Elms-lane, for the London County Council :—

Mowlem & Co., Ltd.	£4,537 0 0	Pedrette & Co.	£3,612 0 0
Westminster Construction Co., Ltd.	4,227 10 9	Cochrane & Sons	3,444 15 5
Heenan & Froude ..	3,783 0 6	Muirhead, Greig, & Matthews	3,428 11 6
Kavanagh & Co.	3,695 8 9	T. W. Pedrette	3,428 7 6
Baker & Co.	3,660 3 6	A. Fasey & Son*	3,414 18 3
Butler & Co.	3,629 5 6		

[The amount of the estimate of the cost of the work was £3,825 2s. 6d.]

LONDON.—For main drainage extension, southern high level sewer No. 2, for the London County Council :—

Hutchinson & Co.	£627,238	9 5
Muirhead, Greig, & Matthews	557,278	6 9
L. P. Nott	553,873	1 5
Bentley & Loch	536,251	1 9
W. Kennedy, Ltd.	517,175	1 1
Perry & Co.	509,2?8	7 9
W. Scott & Middleton	494,785	10 10
J. W. S. Smith & Co.	484,419	16 0
Price & Reeves	478,023	15 11
J. Mowlem & Co.	474,490	8 9
G. Shellabear & Son	451,300	14 1
J. Howe & Co.	450,509	10 1
R. H. Neal, Ltd.	440,635	14 0
S. Pearson & Son, Victoria-st., S.W.*	437,169	9 6
W. Moss & Sons, Ltd.	391,503	8 3

LONDON.—For additional overhead travelling cranes New Cross car-shed, for the London County Council :—

J. Musgrave & Sons, Ltd.	£1,498	0 0
J. Spencer & Co.	1,310	0 0
Dewsbury Electric Manufacturing Co., Ltd.	1,230	5 0
C. & A. Musker (1901), Ltd.	1,134	4 0
Leeds Engineering and Hydraulic Co., Ltd.	1,128	17 0
T. Broadbent & Sons, Ltd.‡	1,102	2 0
Jessop & Appleby Bros. (Leicester and London), Ltd., Leicester*..	1,009	0 0
J. Booth & Bros.	952	6 0
J. Hitchen & Son, Ltd.	1,010 980 915	0 0 0 0 0 0
H. Morris & Bastert, Ltd.‡.....	881	13 7
Carrick & Ritchie‡	859	0 0

[‡ Tender not to specification.]

[Messrs. Jessop & Appleby Bros. (Leicester and London), Ltd., to sublet to the Electric Construction Co., Ltd., of Wolverhampton (or to such other person or firm as may be approved by the chief officer of tramways under the contract), the supply of the electric equipment in connexion with the overhead travelling cranes for the New Cross car-shed.]

LONDON.—Erecting Bearcroft-buildings, King's-road, Fulham, for the London County Council :—

J. Appleby & Sons	£11,200	0 0
Spencer, Santo, & Co.	10,904	0 0
H. Lovatt, Ltd.	10,715	0 0
R. Elvey	10,689	0 0
Kirk & Randall	10,637	0 0
H. L. Holloway	10,580	0 0
S. E. Moss & Co.	10,492	0 0
J. Christie	10,215	0 0
B. E. Nightingale	10,191	0 0
G. E. Wallis & Sons, Ltd.	10,189	0 0
Prestige & Co.	10,061	0 0
T. G. Sharpington	10,000	0 0
Martin, Wells, & Co., Ltd.	10,000	0 0
J. Barker & Co.	9,975	0 0
S. N. Soole & Son	9,938	0 0
E. Lawrence & Sons	9,894	0 0
C. Wall, Ltd.	9,828	0 0
F. & H. F. Higgs	9,750	0 0
Holloway Bros. (London), Ltd.	9,646	0 0
A. Faulks	9,527	13 3
W. Lawrence & Son	9,494	0 0
F. & T. Thorne	9,435	0 0
J. Guttridge	9,433	0 0
J. Garrett & Son	9,307	0 0
A. Hudson & Co.	9,290	0 0
T. J. Hawkins & Co.	8 935	3 1

[The estimate of cost comparable with the tenders is £9,900.]

LONDON.—For the erection of Bekesbourne-buildings (first section), London-street site, Ratcliff, for the London County Council :—

J. Appleby & Sons	£17,969	17 6
H. Lovatt, Ltd.	16,962	19 0
H. L. Holloway	16,941	0 0
Kirk & Randall	16,263	4 10
T. G. Sharpington	16,229	14 0
B. Nightingale	15,992	14 3
Martin, Wells, & Co., Ltd.	15,958	8 3
R. Lawrence & Sons	15,801	8 7
F. J. Coxhead	15,799	17 3
S. E. Moss & Co.	15,730	17 8
Holloway Bros. (London), Ltd.	15,636	5 1
J. Guttridge	15,597	4 10
J. Garrett & Son	15,359	16 8
C. Wall, Ltd.	15,279	0 3
F. & H. F. Higgs	15,183	19 11
W. Lawrence & Son	14,472	19 0
T. J. Hawkins & Co.	14,182	17 10½
F. & T. Thorne, Island Joinery Works, Isle of Dogs, E.*	14,105	3 3

[The estimate of cost comparable with the tenders is £15,029 14s. 1d.]

LONDON.—For the construction of authorised tramways in Garratt-lane, etc. (tenders for roadwork, paving works, etc.), for the London County Council :—

—	Tramways Work.	Paving Works for Street Widenings.	—
	£ s. d.	£ s. d.	£ s. d.
R. W. Blackwell & Co., Ltd.	63,042 12 0	33,159 12 6	96,202 4 6
Dick, Kerr, & Co., Ltd., London*	64,459 6 9	31,782 16 10	96,242 3 7
J. Mowlem & Co., Ltd.	65,351 18 7	31,032 1 5	96,384 0 0
W. Griffiths & Co., Ltd.	68,531 16 1	28,559 5 4	97,091 1 5
J. G. White & Co., Ltd.	64,794 18 0	33,683 11 6	98,478 9 6
Muirhead, Greig, & Matthews	67,875 12 7	32,017 14 7	99,893 7 2
T. C. Starkey	203,687 7 2	58,583 16 0	262,271 3 2
Engineer's estimate	65,291 9 1	33,444 16 5	98,736 5 6

[Messrs. Dick, Kerr, & Co., Ltd., to sub-let to the undermentioned firms (or to such other persons or firms as may be approved by the engineer under the contract) the following portions of the work in connexion with the construction of the tramways from York-road, Wandsworth, *viâ* Red Lion-street, South-street, and Garratt-lane, to Defoe-road, Tooting, namely—(i.) to the Hadfield Steel Foundry Co., Ltd., of Sheffield, the manufacture of the special work (consisting of points, crossings, etc.); (ii.) to the Anderston Foundry Co., Ltd., of Middlesbrough, the manufacture of the cast-iron yokes; (iii.) to Messrs. Doulton, Ltd., of London, the manufacture of the porcelain insulators; (iv.) to Messrs. Bayliss, Jones, & Bayliss, Ltd., of Wolverhampton, the manufacture of the tie-bars, etc.; and (v.) to the Associated Portland Cement Manufacturers Co., Ltd., the supply of cement.]

LONDON.—For the reconstruction of the northern route of the South London tramways system (tenders for roadwork, etc.), for the London County Council :—

—	Tramways Work.	Paving Works for Street Widenings.	—
	£ s. d.	£ s. d.	£ s. d.
J. G. White & Co., Ltd., London*	163,874 11 2	35 371 3 4	199 245 14 6
Dick, Kerr, & Co., Ltd.	169,736 8 0	30,483 2 3	200,219 10 3
W. Griffiths & Co., Ltd.	173,830 4 1	30,547 14 2	204,377 18 3
G. Law	177,284 19 6	27,370 0 6	204,655 0 0
Muirhead, Greig, & Matthews	175,548 12 4	35,066 9 7	210,615 1 11
Engineer's revised estimates	165,491 4 10	33,491 14 7	198,982 19 5

[Messrs. J. G. White & Co., Ltd., to sub-let to the undermentioned firms (or to such other persons or firms as may be approved by the engineer under the contract) the following portions of the work :—(i.) To the Anderston Foundry Company, Ltd., of Middlesbrough, the manufacture of the castings; (ii.) to the Hadfield Steel Foundry Company, Ltd., of Sheffield, and the Lorain Steel Company, Ltd., of Ohio, U.S.A., the supply of the special work (points, crossings, etc.); and (iii.) to the Associated Portland Cement Manufacturers Company, Ltd., the supply of the cement.]

LONDON.—For paving Broad Sanctuary, Gt. George-street, and Parliament-street, for the Westminster City Council :—

—	Material.	Broad Sanctuary.	Gt. George-street.	Parliament-street.
		per sq. yard. s. d.	per sq. yard. s. d.	per sq. yard. s. d.
Acme Flooring and Paving Co., Ltd.	(Tender not in order.	Deviation from specification.)		
W. Griffiths & Co., Ltd.	(Tender not in order.	Deviation from specification.)		
Mowlem & Co.	Deal	9 6	9 6	9 6
	Jarrah or Karri..	13 0	13 0	13 0
French Asphalt Co.	Asphalt	11 0	11 0	11 0
Vale de Travers Asphalt Paving Co.	Asphalt	11 9	11 0	11 9
Limmer Asphalt Paving Co.	Asphalt	11 6	10 6	11 6
Improved Wood Pavement Co.*	Deal	8 3	7 11	8 1
	Spruce	8 2	7 10	8 0
	Jarrah or Karri..	11 8	11 6	11 6

LONDON.—For the erection of boundary railings alongside Dartmouth Park-hill, Waterlow Park, for the London County Council :—

Martin, Wells, & Co., Ltd.....	£690	0	J. R. Robey £594 0
S. Kind	673	0	T. Pearce, Thornton Heath* .. 499 15
F. & T. Thorne..	599	0	

LONDON.—For road works, Portland-avenue, for the Hackney Borough Council. Mr. Norman Scorgie, Borough Engineer and Surveyor, Town Hall, Hackney, N.E. :—

S. Trickett & Sons	£534	18 4	A. T. Catley . £417 7 8
Harvey Bros.	497	8 11	W. Griffiths & Co., Ltd.*.. 446 10 5
G. Porter	483	13 11	

LONDON.—For additions and alterations to basement of Public Library, Manresa-road, Chelsea, for children's reading-rooms, etc., for the Chelsea Public Libraries and Museums Committee. Mr. L. Stokes, architect, 3, Gt. Smith-street, Westminster, S.W. :—

W. F. Picken	£1,424	10 0	Holloway Bros. £1,271 0 0
J. Shelbourne & Co.	1,393	0 0	Vigor & Co.. . 1,263 0 0
Fire-Resisting Corporation, Ltd.	1,375	0 0	Turton & Appleton .. 1,223 0 0
H. Lovall, Ltd.	1,338	0 0	C. P. Roberts 1,222 0 0
G. Wade	1,314	0 0	B. E. Nightingale 1,217 0 0
O. Craske	1,300	0 0	H. Kent 1,2 3 0 0
Patman & Fotheringham	1,286	0 0	Lole & Co. .. 1,197 0 0
Martin, Wells, & Co., Ltd.	1,280	0 0	T. Pearce .. 1,183 14 6
W. Norton ..	1,271	0 0	G. Pride 1,175 0 0
			Whitehead & Co. 1,175 0 0
			J. Christie .. 1,153 19 0
			J. & W. Drake* 1,136 2 9

LONDON.—For the erection of a brick chimney shaft 60 ft. high, for the Borough Council of Bethnal Green. Mr. E. E. Finch, Borough Surveyor and Engineer, Town Hall, Bethnal Green. Quantities by Borough Surveyor and Engineer :—

Universal Engineering Co.	£272	15 0	G. Bulford .. £154 3 6
Patman & Fotheringham	206	0 0	Mattock & Parsons 153 0 0
Myles & Warner.....	183	12 2	Heinrich & Co. 149 11 4
T. Simmonds	178	15 0	T. Torode.... 148 13 3
C. Castle & Son	168	6 7	W. H. Hyde.. 146 0 0
A. Edwards ..	161	12 9½	C. R. Price .. 142 0 0
C. Yates & Co.	158	3 0	W. Neil & Co. 133 16 7
Ferbeck Chimney Construction Co.	156	15 0	F. & T. Thorne, Isle of Dogs, E.* 131 0 0
			F. Webster .. 129 16 5

MAESYCWMMER.—For the erection of fifty-five houses at Maesycwmmer, for the Maesycwmmer Land Building Co., Ltd. Messrs. Ivor Jones & T. E. Richards, architects and surveyors, 18, St. Mary-street, Cardiff :—

	Roofed with Slates.	Patent Self-Lock Roof Tiling.
Davies Bros.	£10,890 0 0	—
Passmore & Perkins	10,862 0 0	£10,670 0
E. Williams	10,550 0 0	—
E. Jones	10,395 0 0	10,230 0
D. Davies	10,390 0 0	—
R. Jones	10,175 0 0	10,065 0
M. Gibbon	10,072 11 10	—
E. Hughes	9,845 0 0	—
Jones, Humphreys, & Ewan	9,803 9 0	9,515 0
L. Davies.....	9,460 0 0	9,322 10
Yeo, Maesycwmmer*	9,444 0 0	—

MAESYCWMMER.—For roads and surface water drains at Maesycwmmer, for the Gelli Deg Isaf Estate. Messrs. Ivor Jones & T. E. Richards, architects and surveyors, 18, St. Mary-street, Cardiff :—

D. Richards..	£1,045	13 5	R. W. Hunter & Co..... £625 1 2
Vodden & Lee	960	10 0	G. Ruttes 614 10 0
F. A. Sheen..	948	9 7	J. Jenkins, Maesycwmmer* 600 0 0
F. Ashley	790	0 0	
Barnes, Chaplin, & Co...	789	13 6	
E. & D. Davis	679	14 0	

PERTH.—For the reconstruction of quay wall at lower harbour, for the Town Council. Mr. R. M'Killop, Burgh Surveyor, 12, Tay-street, Perth :—

T. Leith & Co., Ltd., Victoria-street, Perth*, on schedule prices.

PERTH.—For causeways, etc., King Edward-street, for the Town Council. Mr. R. M'Killop, Burgh Surveyor, 12, Tay-street, Perth :—

P. Tawse, Aberdeen*, on schedule of quantities.

PONTYPOOL.—For proposed rebuilding of the George Hotel, Pontypool, for Messrs. Phillips & Sons, Ltd., Newport, Mon. Messrs. Swalwell & Havard, architects and surveyors, Dock-street, Newport. Quantities by architects :—

W. Jones & Son	£2,577	0 0	J. Edwards & Co. £2,375 0 0
W. P. Lewis	2,575	0 0	J. Jenkins, Ltd. 2,375 0 0
Clements & Co.	2,510	0 0	D. W. Richards, Ltd. 2,307 0 0
J. Linton & Co.	2,500	0 0	C. H. Reed .. 2,300 0 0
J. Charles ..	2,489	0 0	E. R. Evans 2,298 6 9
E. C. Jordan	2,457	0 0	Bowers & Co. 2,257 10 0
J. H. Leadbeter	2,448	0 0	A. S. Morgan & Co., Newport*..... 2,189 0 0
J. Lean & Son	2,405	0 0	

PLAISTOW.—For erecting tramway offices and car depot, Greengate-street, for West Ham Borough Council. Mr. J. G. Morley, Borough Engineer, Town Hall, West Ham, E.

Shelbourne & Co.	£40,227	0 0	Martin, Wells, & Co.	£32,650	0 0
Wilkinson Bros.	37,536	0 0	W. Manders	32,481	0 0
Yates & Co.	36,550	0 0	Works Manager	31,849	0 0
West Bros.	36,206	0 0	Rowley Bros.	31,500	0 0
F. Webster	35,921	15 9	Leslie & Co., Ltd.	31,499	0 0
Horlock & Son	36,034	0 0	A. Hudson & Co.	31,250	0 0
W. H Hyde	35,400	0 0	B. E. Nightingale	31,058	0 0
F. J. Stanley	35,391	0 0	A. E. Symes	31,020	0 0
Perry & Co.	33,987	0 0	Gregar & Son*	30,900	0 0
H. Lovatt Ltd.	33,900	0 0	S. E. Moss & Co.	30,780	0 0
J. E. Johnson & Son	32,730	0 0			
A. Faulks	32,762	5 9			

PRUDHOE.—For alterations and additions to national schools, for the Duke of Northumberland, K.G. Mr. J. Wightman Douglas, architect and surveyor, 1, St. Nicholas-buildings, Newcastle-on-Tyne:—

W. S. Anderson & Son	£1,152	3 0	E. T. George	£900	0 0
T. Dorin	1,038	8 4	G. Watson & Sons	878	10 0
J. T. Phillipson	1,030	2 6	E. R. Davison, Blaydon-on-Tyne*	866	0 0
J. White	1,005	0 0	G. Penty	844	15 0
R. Smithson & Sons	903	0 0			

SHANGHAI.—For a residence at Shanghai, for Mr. G. Gundry. Mr. W. M. Dowdall, architect:—

	Taels.
Yu Yuen Chong	19,000
Oriental Construction Co.	17,825
Shanghai Building & Investment Co., Ltd.	17,720
Zee Kuan Kee	16,500
Zeen Yung Chong	16,900

[All of Shanghai.]

[The present value of the tael is about 2s. 7d. to 2s. 4d. sterling.]

SIDBURY.—For repairs and alterations to national school, for the Sidbury School Managers:—
G. Gabe ..... £121 | S. Turner, Sidbury* £113

STANLEY (Durham).—For street works and improvements on South Moor-lane, and also street crossings at Stanley, Oxhill, and South Moor, for the Urban District Council. Mr. J. Routledge, surveyor, Stanley, R.S.O.:—

Johnson & Strong	£820	14 8	G. E. Simpson	£662	9 4
A. Routledge	740	15 3	McLaren & Son, Gosforth*	619	7 9
R. C. Birtley	695	16 10			

STIRCHLEY.—For erecting a bridge over the Bournville stream, Bond-street (Hennebique's ferro-concrete system), for the King's Norton and Northfield Urban District Council. Mr. A. W. Cross, Engineer, 23, Valentine-road, King's Heath:—
Yorkshire Hennebique Contracting Co., Ltd. £365

SUDBURY.—For new sanitary annexes and drainage at the Union Workhouse, for the Guardians. Messrs. Clare & Ross, architects, 1, West-street, Finsbury-circus, E.C.:—
A. Suckling & Co., Halstead, Essex £2,675

SWANSEA.—For culverting a portion of the Burlais Brook and widening Cwm-road, for the Corporation:—
D. Jenkin & Sons, 89, Lower Oxford-street, Swansea £500

SWANSEA.—For repairs and alterations of the Swansea Market, for the Town Council. Mr. Glendinning Moxham, architect, 39, Castle-street, Swansea:—
Bennett Bros., Heathfield-yard* £3,700

WEST HAM.—For making-up Bradfield-road, for the West Ham Borough Council. Mr. J. G. Morley, Borough Engineer, Town Hall, West Ham, E.:—

D. I. Jackson	£3,707	5 5	Griffiths & Co.	£3,037	6 1
W. Manders	3,667	11 8	G. J. Anderson, Poplar*	2,899	7 2
T. Adams	3,281	4 10	Hewett & Sons	Incomplete	
Parsons & Parsons	3,085	3 3			
J. Jackson	3,059	5 10			

WETHERSFIELD (Essex).—For erecting a dwelling-house, for Mr. F. Wenden. Mr. J. W. Clark, architect, Coggeshall:—

J. T. Deeks	£556	10	T. Wicks	£410	0
C. E. Runnacles	516	0	H. Gooch	385	6
G. Sharp	425	0			

WITTON.—For storage tanks in Hennebique's patent ferro-concrete, Holdford-road, for the Handsworth Urban District Council. Mr. H. Richardson, Engineer and Surveyor, Council House, Handsworth, Birmingham:—

Contract No. 1.

W. Cunliffe	£5,383 19 3
Yorkshire Hennebique Contracting Co.	5,147 10 8
Cruwys & Holrough	4,647 11 0
J. Howe & Co., West Hartlepool*	3,411 6 0

[Engineer's estimate, £5,220 13s. 9d.]

WITTON.—For sewers, manholes, and cast-iron rising main, Holdford-road, for the Handsworth Urban District Council. Mr. H. Richardson, Engineer and Surveyor, Council House, Handsworth, Birmingham:—

Contract No. 2.

E. Boore	£2,067	2 11	Sutherland & Thorpe	£1,569	17 9
Currall, Lewis, & Martin	1,618	0 0	W. Cunliffe, Birmingham*	1,518	2 0

[Engineer's estimate, £2,030 7s. 7d.]

Contract No. 4 (*Machinery, Motors, etc.*).
Tangye's, Ltd., Birmingham* £890
[Engineer's estimate, £890.]

WITTON.—For engine house, engineer's cottage, and boundary wall, Holdford-road, for the Urban District Council of Handsworth. Mr. H. Richardson, Engineer and Surveyor, Council House, Handsworth, Birmingham:—

Contract No. 3.

E. Boore	£1,972	16 3	T. A. Cole & Son	£1,589	5 3
Currall, Lewis, & Martin	1,918	5 4	Lee & Son	1,589	0 0
W. Cunliffe	1,807	1 3	G. E. Jackson, Oldbury*	1,496	12 3
W. Hopkins	1,620	0 0			
T. Johnson	1,606	2 11			

[Engineer's estimate, £2,098 18s. 8d.]

WOKING.—For alterations and additions, etc., manual instruction and cookery room, Westfield Council School, Woking, for the Surrey Education Committee. Messrs. Jarvis & Richards, architects, 36, Victoria-street, London, S.W.:—

J. Whitburn	£6,002	0 0	Drowley & Co.	£5,277	0 0
R. Wood & Son	5,911	6 2	Martin Wells & Co.	5,255	0 0
Enness Bros.	5,723	9 0	W. W. Gale	5,250	3 6
H. Kent	5,672	0 0	Moss & Co.	5,247	11 0
T. Stimson	5,665	0 0	H. Harris	5,214	0 0
G. Lawrence	5,664	0 0	J. & N. Patrick	5,120	0 0
W. H. Lorden	5,656	0 0			
Turtle & Appleton	5,586	0 0			

WOKING.—For additions to Goldsworth Council School, Woking, for the Surrey Education Committee. Messrs. Jarvis & Richards, architects, 36, Victoria-street, Westminster, S.W.:—

Ingram & Son	£1,124	10 3	Drowley & Co.	£899	0 0
East & Hyde	986	9 0	G. Kemp	894	0 0
Martin, Wells, & Co.	965	0 0	McC. E. Fitt	887	0 0
Hughes	950	6 7	W. W. Gale*	881	13 11

WORTHING.—For erecting a disinfector station at Swandean, Durrington, for the Corporation. Mr. F. Roberts, Borough Engineer and Surveyor, Worthing:—

Bostel Bros.	£708	16 0	W. W. Sandell	£640	0 0
A. Crane	676	19 1	A. Duffield	626	5 0
J. H. Lelliott	676	5 0	W. J. East, Worthing*	613	4 2
Longley & Co.	649	0 0			

[Surveyor's estimate, £641.]

YSTRAD-MYNACH.—For erecting a vestry for the Trustees of Hengoed Welsh Baptist Chapel. Mr. R. Edwards, architect and surveyor, Brynhenlog, Treharris:—

W. & D. Thomas	£690	0	A. J. Sketchley & Co.	£629	0
L. Davies	640	0	J. Lloyd, Ystrad-Mynach*	595	0
E. Price	638	5			

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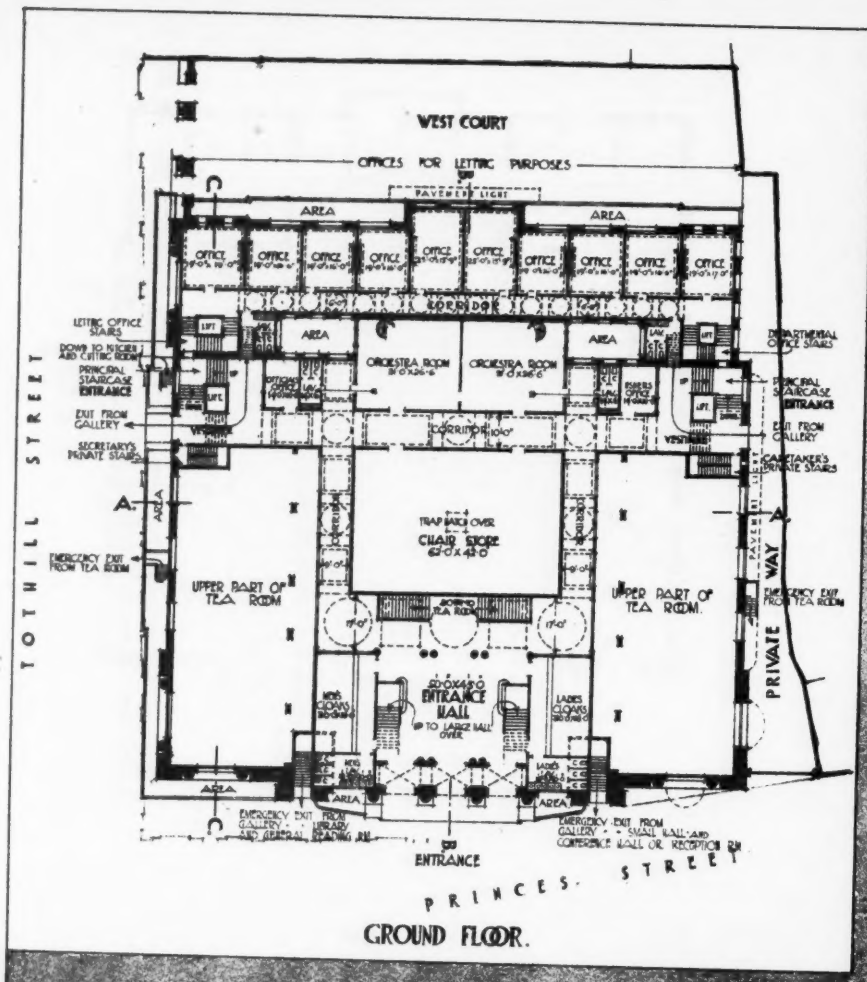
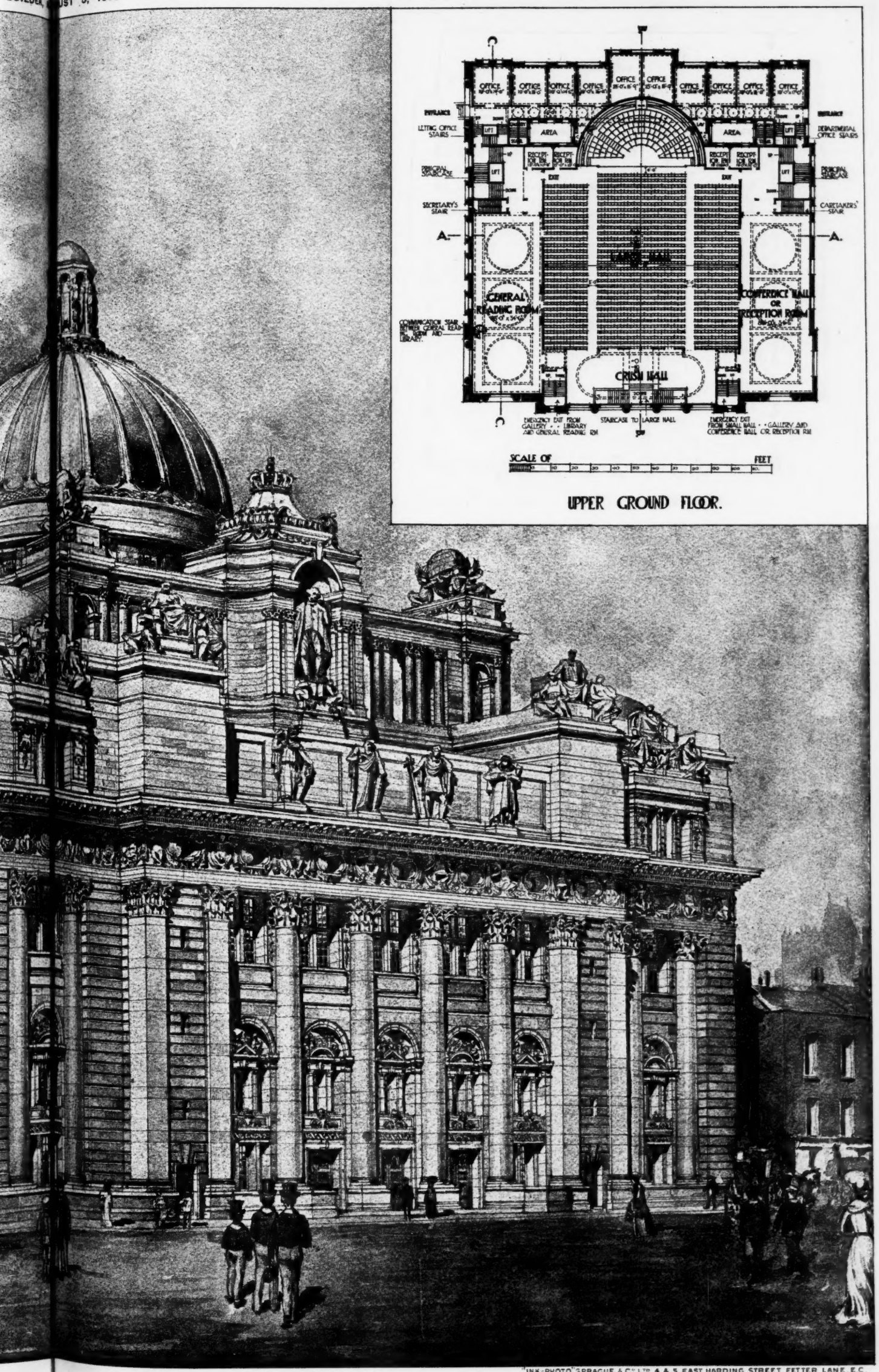


GROUND FLOOR.

WESLEYAN HALL COMPETITION.—DESIGN BY MR. E. V



UPPER GROUND FLOOR.

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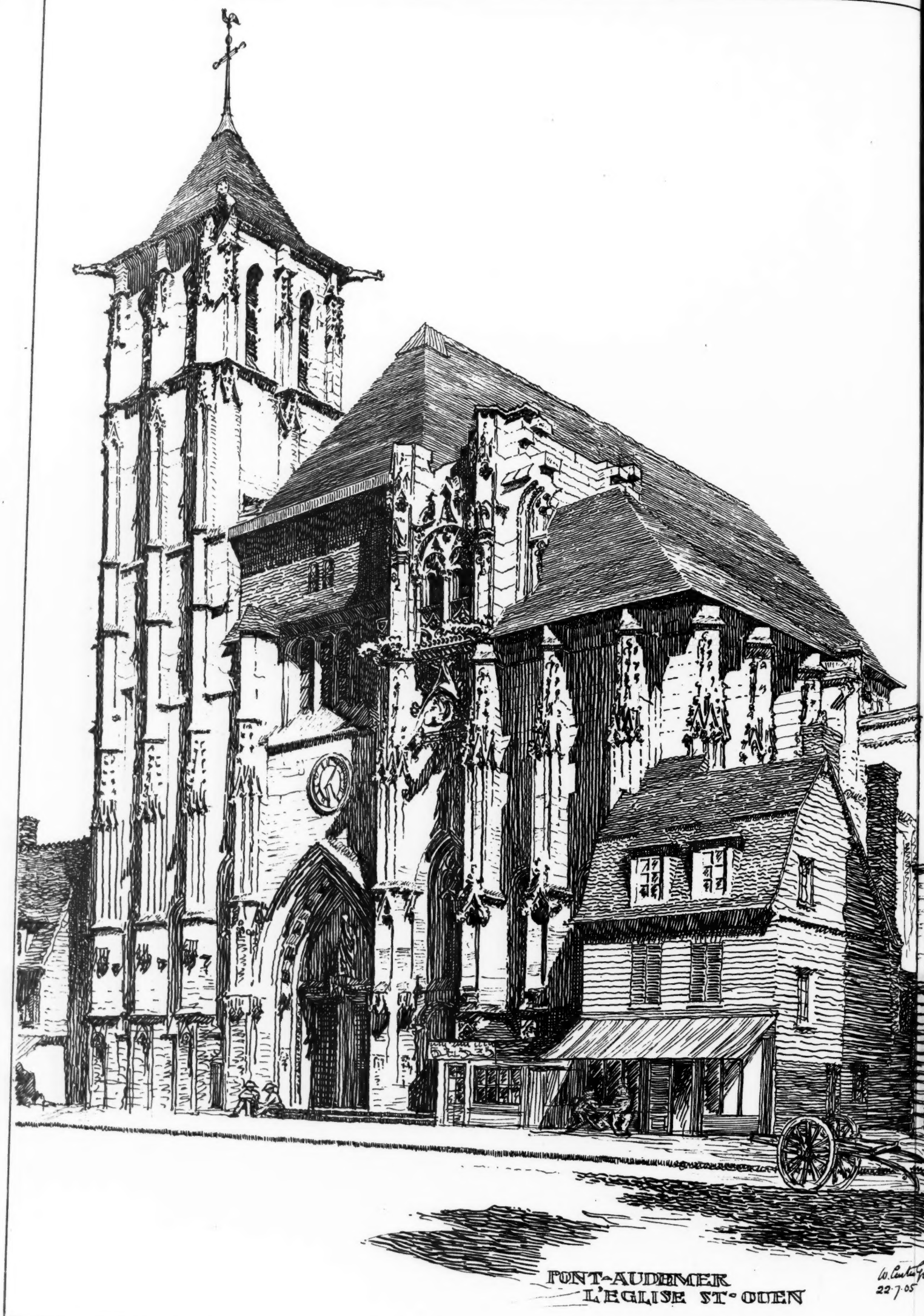
TION.—DESIGN BY MR. E. VINCENT HARRIS, A.R.I.B.A.



PONT-AUDEMER
L'EGLISE ST-OUEN

W. Curtis Green. del.
22.7.05

CAUDEBEC-EN-CAUX. PLACE DE L'EGLISE

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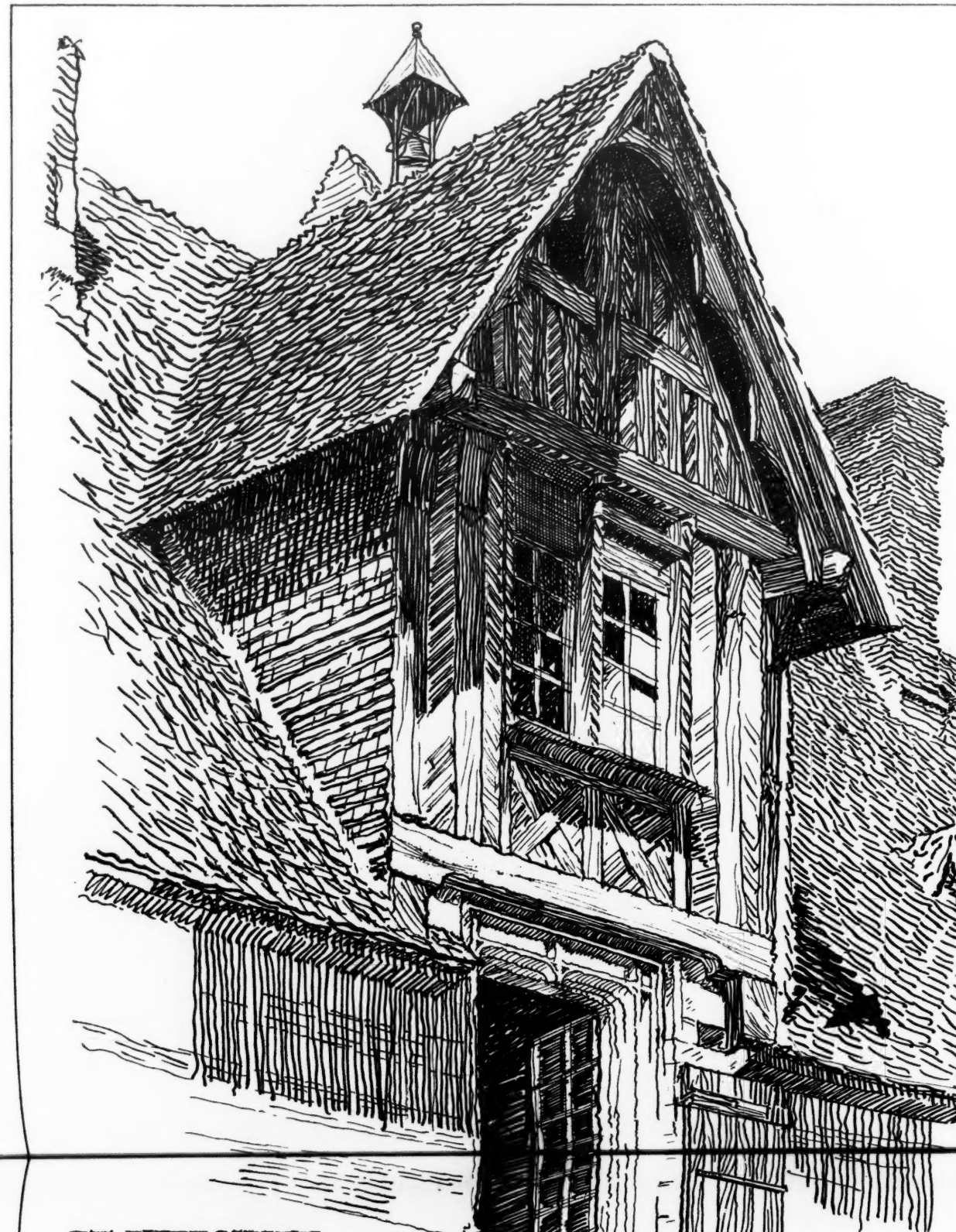
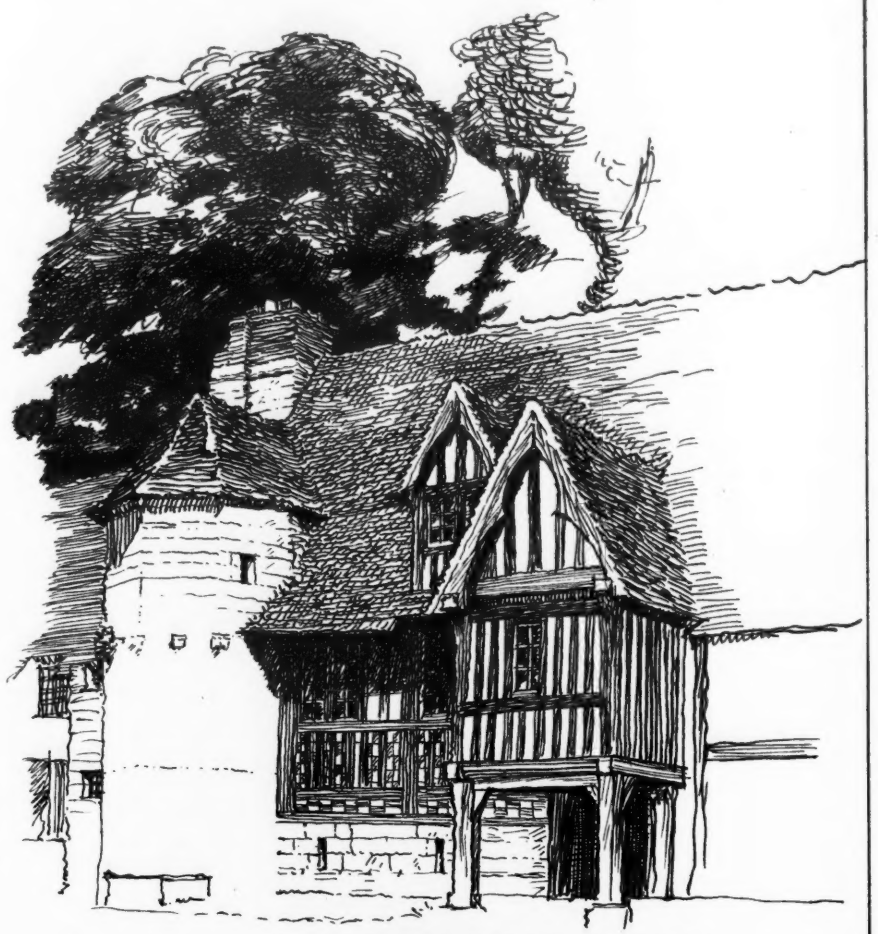
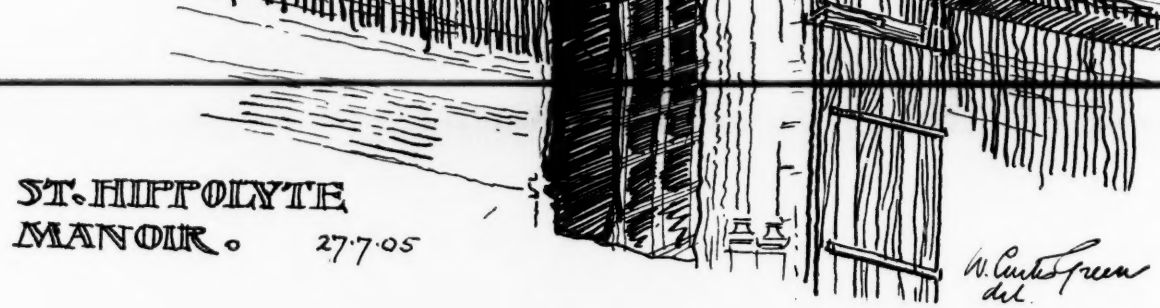
URAL ASSOCIATION EXCURSION IN NORMANDY.



ST. HIPPOLYTE

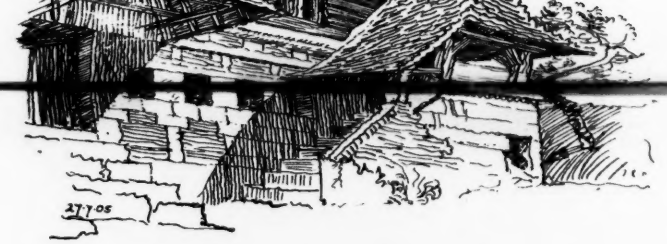


CANAPVILLE MANOR.

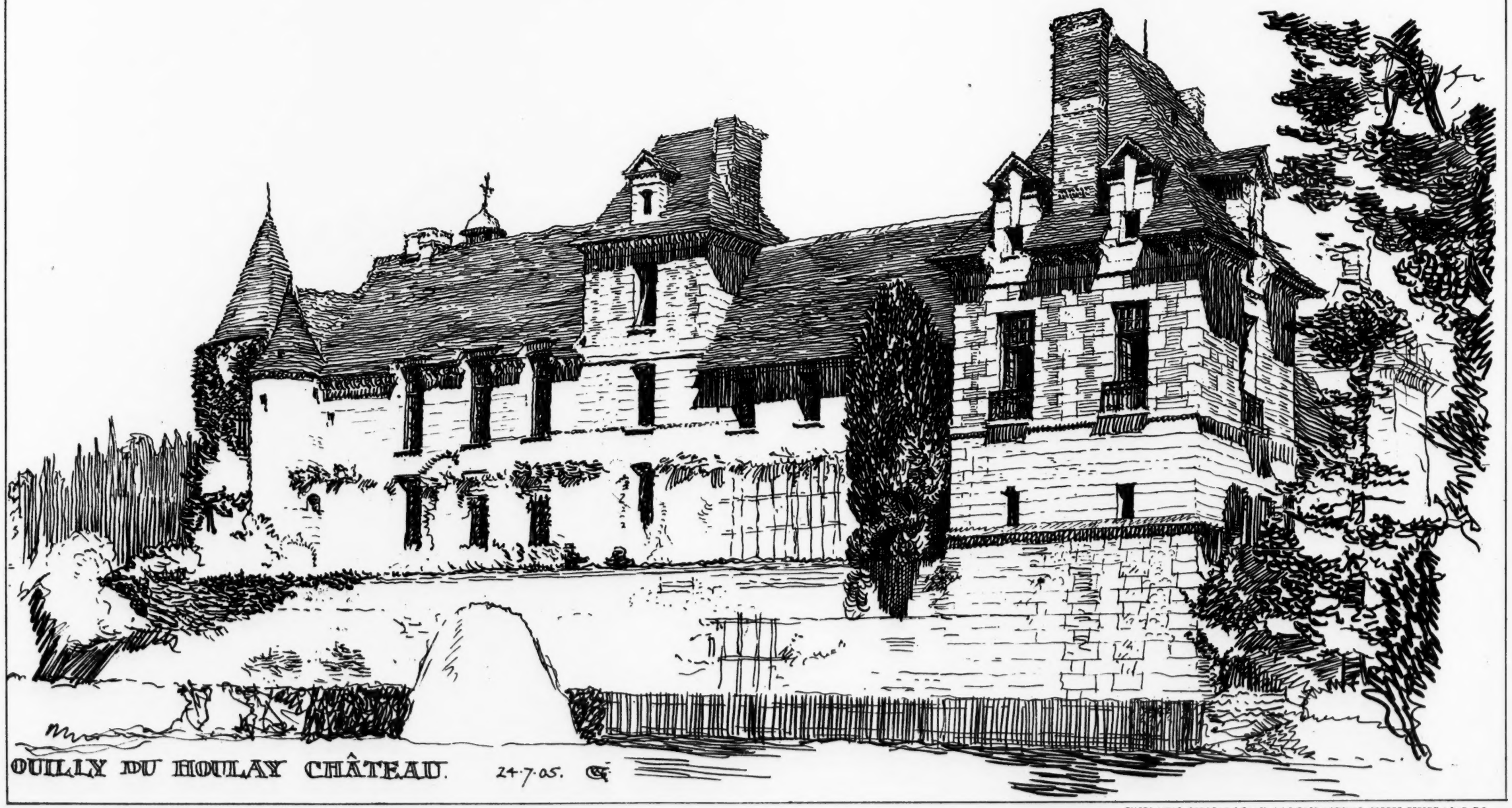


ST. HIPPOLYTE
MANOIR. 27·7·05

W. Curtis Green
del.



A FARM HOUSE. 27·7·05.



OUILLY DU HOULAY CHÂTEAU. 24·7·05. WCG

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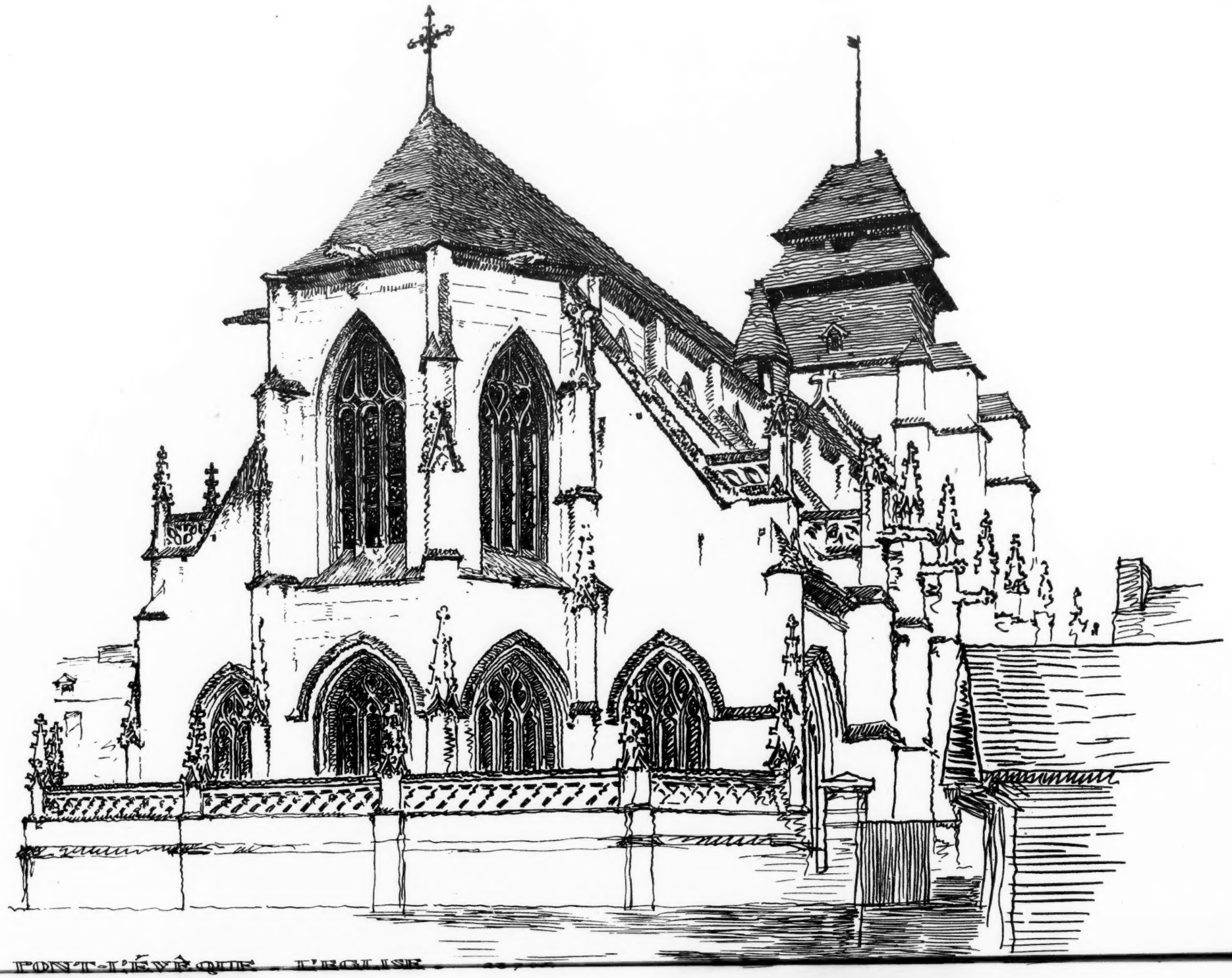
SKETCHES WITH THE ARCHITECTURAL ASSOCIATION EXCURSION IN NORMANDY



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PONT-L'EVEQUE. - L'EGLISE. - 20/7/05

PONT-L'ÉVÊQUE
ANCIEN COUVENT DES
DAMES DOMINICAINES
DE L'ILE.

W. Curtis Green del
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